# Exhibit 2

Page 1

1                IN THE UNITED STATES DISTRICT COURT

              FOR THE DISTRICT OF SOUTH CAROLINA

2                      COLUMBIA DIVISION

3     THE SOUTH CAROLINA STATE

      CONFERENCE OF THE NAACP,

4     et al.,

5                Plaintiffs,

6     vs.                    CASE NO. 3:21-cv-03302-MGL-TJH-RMG

7     THOMAS C. ALEXANDER,

      et al.,

8

9                Defendants.

10

11    DEPOSITION OF:      KOSUKE IMAI, PhD (Via VTC)

12    DATE:               August 8, 2022

13    TIME:               11:04 a.m.

14    LOCATION:           Cambridge, MA

15    TAKEN BY:           Counsel for the Senate Defendants

16    REPORTED BY:        SOLANGE RUIZ-URIBE, Court Reporter

                          Via Videoteleconference

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Kosuke Imai, PhD                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 2

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19
20          ALSO PRESENT:
21                  SAMANTHA FORAN, ACLU Intern
22
23                  (INDEX AT REAR OF TRANSCRIPT)
24
25
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Page 4

1                    KOSUKE IMAI, PhD,

2      after first being duly sworn, testified as follows:

3                       EXAMINATION

4      BY MR. GORE:

5           Q.   Good morning, Dr. Imai.

6           A.   Good morning.

7           Q.   Thank you for being here today.  For the

8      record will you say your full name and spell your

9      last name, please.

10          A.    Kosuke Imai, it's spelled I-M-A-I.

11          Q.   Dr. Imai, my name is John Gore.  I'm with

12     the law firm of Jones Day.  I represent the Senate

13     defendants, Senate President Thomas Alexander and

14     Senate Judiciary Committee Chairman, Luke Rankin,

15     and we are here today in the Congressional

16     redistricting case in South Carolina.

17                     Do you understand that you are

18     appearing in connection with that case?

19          A.   Yes, I do.

20          Q.   The court reporter has just placed you

21     under oath and do you understand that means you are

22     under an obligation to tell the truth today?

23          A.   Yes, I do.

24          Q.   Is there any reason you are unable to

25     testify truthfully today?

Page 5

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 1          A.    No.
 2          Q.    The court reporter is here to take down
 3    your testimony and to do so she'll need verbal
 4    answers; yes and no.  She can't record nods or
 5    shakes of the head.  Does that make sense?
 6          A.    Okay, yes.  That makes sense.
 7          Q.    And are you being represented by counsel
 8    here today?
 9          A.    Yes.
10          Q.    And who is that?
11          A.    Mr. Cepeda.
12          Q.    So Mr. Cepeda may from time to time object
13    to some of my questions, things like objection to
14    form, and he's obviously entitled to do that.  But
15    unless he instructs you not to answer, you should go
16    ahead and answer all of my questions.
17          A.    Okay.
18          Q.    Do you understand that?
19          A.    That makes sense, yes.
20          Q.    And most important rule today, if you
21    don't understand a question please ask me to
22    clarify.  Can we have that agreement?
23          A.    Yes, I will.
24          Q.    And if you answer a question I'm going to
25    assume that you understood it; is that fair?
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Kosuke Imai, PhD                                August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 6

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 1            A.    That's fair.
 2            Q.    And of course, if you need to take a break
 3    for any reason just please let me know and we can
 4    take a break.  We'll take periodic breaks throughout
 5    the day.  My only request is that if a question is
 6    pending, you answer the question before we take the
 7    break; does that make sense?
 8            A.    Yes, that makes sense.
 9            Q.    Okay.  Great.  How many times have you
10    been deposed, Dr. Imai?
11            A.    I think I had once before.
12            Q.    Okay.  And do you remember which case that
13    was?
14            A.    I think it was a South Carolina house
15    case.
16            Q.    Okay.  Dr. Imai, where are you today?
17            A.    I'm in Cambridge, Massachusetts.
18            Q.    And is anyone in the room with you?
19            A.    No.
20            Q.    What did you do to prepare for today's
21    deposition?
22            A.    I reviewed my own report and exhibits that
23    were sent by Mr. Cepeda and I also had conversations
24    with Mr. Cepeda.
25            Q.    How many conversations have you had with
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Page 7

1    Mr. Cepeda?

2         A.    I think we had maybe four times, four or

3    five times before this -- before today.

4         Q.    When did those conversations take place?

5         A.    Most recently it took place on Friday and

6    Saturday of last week and before that we had a

7    conversation, if I recall correctly, I think the

8    last week or the last couple weeks of July.

9         Q.    How long did each of those conversations

10   last?

11        A.    I'd say an hour to two hours, one hour to

12   two hours.

13        Q.    Was anyone else present for those

14   conversations?

15        A.    I think that Ms. Yan may have been present

16   in not all -- not all instances but one or two

17   times.

18        Q.    And apart from Mr. Cepeda and Ms. Yan have

19   you discussed today's deposition with anyone else?

20        A.    No.

21        Q.    Do you have any documents with you today?

22        A.    I have my own expert report which was sent

23   to me, just printed out a copy of it, a paper copy

24   of it as well as some other materials that was sent

25   by the -- you know, the exhibit materials that were

Page 8

1    sent by counsel, the South Carolina House

2    Representative Redistricting Guideline copy as well

3    as Senate Guideline copy and two reports by Mr. Sean

4    Trende that were also sent to me by counsel as part

5    of the exhibit, you know, the exhibit folder that I

6    received.  I just printed them up just in case that

7    I need to reference them.

8         Q.    Do any of your documents have handwritten

9    notes on them?

10        A.    No.

11        Q.    We touched on this a little bit before but

12   which documents did you review in preparing for

13   today's deposition?

14        A.    So I reviewed my own report.  I also

15   reviewed the reports by Mr. Sean Trende, two reports

16   that were sent to me as part of the exhibit.  I also

17   reviewed the redistricting guidelines, the House and

18   Senate Redistricting Guidelines that was also sent

19   to me as part of the exhibit materials.  And I also

20   reviewed, you know, other materials that were sent

21   to me as part of the exhibit, some of them brief,

22   very briefly.

23        Q.    At any time have you reviewed any of the

24   other plaintiffs' expert reports in this case?

25        A.    Can you repeat the question again?  Sorry.

Page 9

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 1          Q.    Certainly.  At any time have you reviewed

 2     any of the other plaintiffs' expert reports in this

 3     case?

 4          A.    I don't recall reviewing other experts

 5     reports, yeah.

 6          Q.    So have you reviewed any expert reports by

 7     Dr. Baodong Liu?

 8          A.    No.

 9          Q.    Moon Duchin?

10          A.    No.

11          Q.    Dr. Bagley?

12          A.    No.

13          Q.    Or Dr. Ragusa?

14          A.    No.

15          Q.    Thank you.  Dr. Imai, I'm going to

16     introduce as the first exhibit the document that was

17     sent to you as tab one in the zip folder, if you

18     want to turn to that.

19          A.    Yeah.

20               (Defendant's Exhibit No. 1, SENATE

21     DEFENDANTS' AMENDED NOTICE OF TAKING VIDEO CONFERENCE

22     DEPOSITION OF KOSUKE IMAI, PHD, was marked for

23     identification.)

24               THE WITNESS:  Okay.  I have it opened.

25     BY MR. GORE:
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Page 10

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 1          Q.    And I'm going to display this as well as

 2     in Exhibit Share --

 3          A.    Okay.

 4          Q.    For the benefit of counsel and our court

 5     reporter.  Dr. Imai, do you recognize this document?

 6          A.    Yes.

 7          Q.    What document is this?

 8          A.    This is the announcement about notice of

 9     deposition.

10          Q.    And do you recall receiving this document?

11          A.    Yes, I do.

12          Q.    Now turn with me, if you will, to what I

13     believe is the seventh page or so of this document.

14          A.    Seventh page.

15          Q.    The page has Exhibit A at the top.

16          A.    Yes.

17          Q.    And the letter A, B and C.  Do you see

18     that?

19          A.    Yes, I see that.

20          Q.    And this is a subpoena for you to produce

21     documents in connection with your testimony.  What

22     did you do to collect documents listed here on

23     Exhibit A?

24          A.    For Exhibit A I listed all the books and

25     treatises and articles and publication that were
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Page 11

1    used in my, you know, to formulate my opinions in

2    this case in my own expert report.  And so I asked

3    counsel to simply submit those for Exhibit B and C.

4    I was struggling during the time when this request

5    came and so I asked counsel to prepare these because

6    all these items were with counsel and, you know,

7    they were cc'd on email.

8                    And then I, upon my return from my

9    travel I checked my inbox and to make sure that no

10   item is missing, I sent all the list of items that I

11   have to counsel to cross-check.  And I confirmed

12   that, all the materials, relevant materials being

13   submitted.

14       Q.   Dr. Imai, did you receive any data from

15   plaintiffs' counsel in this case --

16       A.   Yes.

17       Q.   To form your report?

18       A.   Yes, I did.

19       Q.   And what data did you receive?

20       A.   All the data that were used in my analysis

21   which are listed in my expert report I received from

22   counsel.

23       Q.   And other than the data listed in your

24   expert report did you receive any other data from

25   plaintiffs' counsel?

Page 12

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 1            A.    There may have been included in the data

 2      that were shared with me that, you know, for

 3      example, there may have been variables that I did

 4      not use, I did not end up using in my analysis, but

 5      I don't recall exactly what were, you know, in the

 6      data shared but not included in my analysis.

 7            Q.    And whether you used the data or not, what

 8      types of data did plaintiffs' counsel provide you?

 9            A.    Data mostly from the census data, the

10      shared files and population few years and racial

11      information that I used.  And then in addition there

12      were also data about incumbent residence location

13      which I used for my analysis.

14            Q.    Did counsel provide you with any election

15      data?

16            A.    I don't think so but again, you know, I

17      did not use them at all in my analysis.  I cannot

18      100 percent certain that no election data were

19      included in the -- in the data that were sent to me

20      but I certainly did not look at them.

21            Q.    Did counsel provide you any assumptions to

22      rely on in your expert report?

23            A.    We discussed the assumptions that I used

24      in my analysis during conversations we had in the

25      course of preparing my draft report and -- but yeah,
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Page 13

1      that's what I received, some feedback.

2          Q.    And what assumptions did counsel provide

3      you that you relied on in your expert report?

4                MR. CEPEDA:   Objection; mischaracterizes

5      the record.

6                MR. GORE:   You can answer.

7                THE WITNESS:   The assumptions were not

8      directly provided.  We may have discussed them

9      during our conversations of draft reports but all

10     the assumptions that I ended up imposing in my final

11     report are my own decisions.

12     BY MR. GORE:

13         Q.    And are those assumptions disclosed in

14     your expert report?

15         A.    Yes.  All the assumptions are written in

16     the expert report.

17         Q.    Okay.

18         A.    In the form of algorithm constraints, just

19     to be clear.

20         Q.    Thank you.  Dr. Imai, I want to talk a

21     little bit about how you were hired for this case.

22     Do you recall who first contacted you about this

23     case?

24         A.    I think it was Ms. Yan but I might be

25     wrong.  It could be Mr. Cepeda but I think one of

1     the two people contacted me first.

2          Q.     And do you have a formal engagement letter

3     with the ACLU or the NAACP Legal Defense Fund?

4          A.     Yes, I do.

5          Q.     And who is that with?

6          A.     I think it was with the ACLU.

7          Q.     And other than this case are there any

8     other cases where you have been retained by the

9     ACLU?

10         A.     Yes.  Oh, would you like me to list them?

11         Q.     I'll ask follow-up questions.  Can you

12     tell me what those cases are?

13         A.     Okay.  So it should be listed in my expert

14     report but they are Alabama Congressional case and

15     Ohio State House Congressional case.  Let's see.

16     And the South Carolina State House case.  Yeah, I

17     think that's -- that's it.

18         Q.     How much are you charging for your work in

19     this case?

20         A.     So it's a hourly charge of $450.

21         Q.     Do you have a cap on your fees for this

22     case?

23         A.     There may have been a cap in the agreement

24     that needs to be discussed if I reach that cap but I

25     don't recall specifics.

Page 15

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 1           Q.   Did anyone assist you in preparing your

 2      expert report?

 3           A.   Yes.

 4           Q.   Who is that?

 5           A.   So I have research assistants and there

 6      are three research assistants that were involved in

 7      preparing for my expert report.  One is Shiro

 8      Kuriwaki.  Would you like me to spell that for you?

 9           Q.   Please.

10           A.   Okay.  Shiro is S-H-I-R-O.  And Kuriwaki

11      is K-U-R-I-W-A-K-I.  And Tyler Sinko.  Sinko is

12      S-I-N-K-O.  And Kevin Wang.  K-E -- oh, Kevin you

13      know.  Wang is W-A-N-G.

14           Q.   What did Shiro do to assist you on your

15      report?

16           A.   He helped me, under my guidance, run

17      simulations, make figures, et cetera.

18           Q.   What did Tyler do to assist you on your

19      expert report?

20           A.   The same.

21           Q.   How about Kevin?

22           A.   The same.

23           Q.   Has anyone conducted a peer review of your

24      expert report?

25           A.   I don't think so.  Would you -- do you
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Page 16

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 1      mean the academic peer reviews?

 2            Q.    Yes.

 3            A.    No, no.

 4            Q.    Dr. Imai, I'm next going to pull up your

 5      expert report.

 6            A.    Okay.

 7            Q.    Which I believe is tab two in your binder.

 8            A.    Yes, I got this opened.

 9                  (Defendant's Exhibit No. 2, EXPERT REPORT OF

10      KOSUKE IMAI, PH.D. DATED APRIL 4, 2022, was marked for

11      identification.)

12      BY MR. GORE:

13            Q.    I'm introducing this now as Exhibit Two

14      and loading it into Exhibit Share.  Dr. Imai, do you

15      recognize this document?

16            A.    Yes.

17            Q.    What is this document?

18            A.    This is a report I wrote.

19            Q.    Does this expert report contain all of

20      your opinions related to the Congressional plan

21      litigation?

22            A.    Yes.

23            Q.    Do you intend to offer any opinions at

24      trial that are not contained in your report?

25            A.    No.
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Kosuke Imai, PhD                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 17

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 1              Q.    Do you intend to supplement or amend your

 2      report?

 3              A.    Not right now.

 4              Q.    Did you prepare a rebuttal report in this

 5      case?

 6              A.    No, I didn't.

 7              Q.    Why not?

 8              A.    I reviewed the report by Mr. Trende and --

 9      but he did not use any simulation analysis and, you

10      know, my expertise is about redistricting simulation

11      so I decided to not offer any opinions on that

12      particular report.

13              Q.    Dr. Imai, I'm going to turn to page 31 of

14      your report.

15              A.    Okay, page 31.

16              Q.    Which is a copy of your CV.

17              A.    Oh, okay.

18              Q.    But I understand this may no longer be

19      your current CV.  Is this still your current CV?

20              A.    No.  This was prepared when I submitted my

21      report back in April.

22              Q.    And I'm going to pull up what I believe is

23      your updated CV which unfortunately is not included

24      in your zip file.

25              A.    Oh, okay.
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Page 18

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 1          Q.   But I will pull it up on Exhibit Share and

 2     I can share my screen with you if you can see it.

 3     Do you have access to Exhibit Share?

 4          A.   I don't have -- that's the software

 5     that --

 6          Q.   Yeah, it's part --

 7          A.   No.

 8          Q.   A browser.

 9          A.   Okay.  I don't have that right now.

10          Q.   Now, Dr. Imai, I have tried to share my

11     screen with you.

12          A.   Yeah.

13          Q.   And it's small on your monitor.  Can you

14     see that?

15          A.   I can see that.  It's big now.

16          Q.   And this I believe is your -- this is --

17     says Kosuke Imai CV June 2022; is that correct?

18          A.   That's correct.

19          Q.   And do you recognize this document?

20          A.   Yes.  I shared this with counsel.

21          Q.   And what is this?

22          A.   My CV.

23          Q.   Is it your current CV?

24          A.   Well, it's CV as of June, you know, as of

25     June when I received that request.
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Kosuke Imai, PhD                                      August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 19

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 1          Q.    I've marked this as Exhibit Three for the

 2     record.

 3               (Defendant's Exhibit No. 3, JUNE 2022

 4     CURRICULUM VITAE OF KOSUKE IMAI, was marked for

 5     identification.)

 6     BY MR. GORE:

 7          Q.    Dr. Imai, can you briefly describe your

 8     educational background.

 9          A.    Yes.  I received bachelor of arts in

10     liberal arts from University of Tokyo in 1998.  I

11     received a master's degree in statistics from

12     Harvard in 2002 and I received PhD in political

13     science from also Harvard in 2003.

14          Q.    And as part of your education did you take

15     any classes in legislative redistricting?

16          A.    Oh, there is no such a class back then

17     that I was aware of so I did not take it.

18          Q.    And when did redistricting become part of

19     your studies or scholarship?

20          A.    I think it was around 2010.

21          Q.    And how did you become interested in

22     redistricting as a topic of scholarship?

23          A.    You know, I was interested in methodology

24     that's used to evaluate redistricting trends because

25     my expertise is political methodology which is
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Page 20

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 1        greater study of algorithms and statistical methods

 2        for understanding political science.  So this was

 3        one of the important topics in the field.

 4             Q.    And what is the focus of your legislative

 5        redistricting scholarship?

 6             A.    There are -- there are two components.

 7        One is the development and application of algorithms

 8        to evaluate the redistricting trends.  And the

 9        second part is the method development for ecological

10        inference which basically trying to inquire

11        individual behavior from aggregate data.

12             Q.    Have you written any peer-reviewed

13        publications about South Carolina?

14             A.    No.

15             Q.    Have you submitted any works for

16        publication that were not published?

17             A.    Can you repeat that question again?

18             Q.    Sure.  During your career --

19             A.    Uh-huh.

20             Q.    Have you submitted any articles, books or

21        other written works for peer review that were

22        rejected for publication and not published?

23             A.    Oh, I see.  Yes, yes.

24             Q.    How many, how many of those?

25             A.    Oh, you can count, you know, number of
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Page 21

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 1      publications I have but it's hard to count the

 2      number of rejections.  Many.

 3           Q.    Any about redistricting?

 4           A.    Oh, yes.

 5           Q.    And what do you recall about any of those

 6      publications and why they were rejected?

 7           A.    I don't recall specifics of reasons for

 8      rejections, you know.  It ranges from, you know,

 9      complaints about the algorithm itself or complaints

10      about -- or criticism, I shouldn't say complaints --

11      criticism about applications, criticism about

12      literature reviewed to, you know -- it ranges by one

13      review to another.  So I don't recall all the

14      specifics.

15           Q.    And were any of these draft articles about

16      simulation analysis?

17           A.    Oh, yes.

18           Q.    And what do you recall about criticisms of

19      those articles?

20           A.    So for example, the paper I eventually

21      published in Journal of Computational and Graphical

22      Statistics, during that review process of that

23      paper, there were criticism about how, you know, the

24      full particular performance of the algorithm I was

25      studying at that time.  And there may have been also
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Page 22

1    criticisms about the interpretation of the empirical

2    applications of that particular algorithm.

3        Q.    And with respect to these draft articles,

4    did any of them discuss or relate to the simulation

5    analysis you used for your expert report in this

6    case?

7        A.    They are related but they are not the ones

8    that I used for this analysis.

9        Q.    What were the simulation analyses in your

10   draft articles that were rejected for publication?

11   Can you explain to me what those were?

12       A.    Can you repeat that question again?

13       Q.    Sure.  I'd just like to understand the

14   differences between those simulation analyses and

15   the one you did in this report.  So can you explain

16   to me the differences or explain to me what those

17   analyses were and I'll follow up by asking about

18   your analysis in this case.

19       A.    Okay.  Just to be clear, rejection doesn't

20   necessarily mean that the paper will never be

21   published.  So if -- it's an iterative process, so

22   often it's very rare for paper in academic journals

23   to be accepted when you submit and often it will be

24   rejected and sometimes you will be asked to revise,

25   to address the criticism and resubmit.

Page 23

1                    And eventually the paper may get

2        accepted or the paper may be submitted to a

3        different journal and then again through the review

4        process you -- after it goes through the process

5        eventually, you know, the paper gets accepted.

6                    So it's a long process so the fact

7        that the paper is rejected doesn't necessarily mean

8        it will never be published, just to make sure that's

9        understood.

10                    And the difference between algorithm

11        that I used which is the merge-split type algorithm

12        that's explained in my expert report is different

13        from the algorithms that were developed in the

14        articles that I have.  They are both, all these

15        algorithms are part of the Monte Carlo methods, it's

16        a broad class of mathematical algorithms that try to

17        plan and regenerate representative sample from the

18        particular populations.  It's all related, part of

19        the Monte Carlo family.

20                    But the algorithm that I used which

21        is the merge-split, broadly speaking, basically is a

22        Markov chain Monte Carlo algorithm where you

23        basically randomly choose two districts, adjacent

24        districts, and you launch them and then you run the

25        resplit in a specific way and then you retreat.  So

Page 24

1      that you start with a particular plan might be an

2      enacted plan and then you'll randomly merge two

3      adjacent districts and then randomly split them and

4      that way you start modifying the plan.

5                      The algorithm that I developed in my

6      own article, there are two types.  One is called

7      Frep, which basically start modifying the boundaries

8      of particular units by swapping certain units, say

9      precincts, from one district to another in a

10     specific way and then proceed.

11                     The other one is called sequential

12     Monte Carlo which basically starts from scratch so

13     it's a blank slate and it starts creating one

14     district at a time.

15                     So these are the different types of

16     algorithms that are all part of the family of Monte

17     Carlo methods and for this case I used the more

18     split-type algorithm.

19          Q.   Thank you for all that.  I'm going to

20     scroll down on your CV to what I believe is the last

21     page.  It appears to be buffering.

22          A.   Yeah.

23          Q.   Let me do this a different way.

24          A.   Yeah.

25          Q.   Let's go back to your expert report if we

Kosuke Imai, PhD                                      August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 25

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 1      can.
 2            A.    Okay.
 3            Q.    Which was previously marked as Exhibit
 4      Two.
 5            A.    Right.  I have Two, right.
 6            Q.    Yes.
 7            A.    Okay.
 8                  MR. CEPEDA:  Tab two is the CV.
 9                  MR. GORE:  I think tab one was the notice
10      of deposition.  Tab two is the report which
11      contained an old version of the CV.
12                  MR. CEPEDA:  Yeah.
13                  MR. GORE:  And I've marked the new version
14      of the CV as Exhibit Three, although it wasn't a
15      tab.  I'm trying to pull this back up if I can.
16      That's back in Exhibit Share.  Exhibit Two.
17      BY MR. GORE:
18            Q.    And I want to go, Dr. Imai, if we might,
19      to paragraph -- let's start with paragraph 13 on
20      page 6.
21            A.    Oh, so this is tab two?
22            Q.    Yes, sir.
23            A.    Thirteen.  Okay page 13 of which
24      paragraph?
25            Q.    It's -- sorry, paragraph 13.
```

Page 26

```
 1            A.    Oh, 13 you said.

 2            Q.    Yeah.

 3            A.    Thirteen, page 6.  Okay.  I have it here.

 4            Q.    Paragraph 13 mentions that your

 5       methodology for predicting individuals' race was

 6       used in a recent decision of the Second Circuit?

 7            A.    That's right.

 8            Q.    Were you an expert witness in that case?

 9            A.    No.

10            Q.    What is your methodology for predicting

11       individuals' race using voter files and census data?

12            A.    So I focus on developing statistical

13       methodology to use voter file information,

14       information from voter files such as name and

15       address of registered voters and tried to impute the

16       race which is used in some of the ecological

17       inference analysis.

18            Q.    Is that the same as Bayesian Improved

19       Surname Geocoding?

20            A.    That's correct.

21            Q.    Thank you.  All right.  Now, let's look at

22       paragraph 14.

23            A.    Okay.

24            Q.    And I want to ask you if this is a

25       complete list of all cases in which you have been an
```

Page 27

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 1      expert witness?

 2           A.   So I have filed expert report in July,

 3      maybe it's three or four weeks ago for Jacksonville,

 4      Florida case which was not included when this CV was

 5      submitted back in March or April.

 6           Q.   And what -- is the Jacksonville case also

 7      a redistricting case?

 8           A.   Yes.  It's a city council redistricting

 9      case.

10           Q.   Other than the Jacksonville case does

11      paragraph 14 list all cases in which you have

12      appeared as an expert or submitted an expert report?

13           A.   I think so.  Except Ohio case has evolved

14      and I'm involved in both state legislative case and

15      Congressional case and sometimes I'm not 100 percent

16      sure what the name of the case is.  I think that has

17      changed.  But either way, I submitted reports to

18      those two cases.

19           Q.   Are all the cases in which you have been

20      an expert redistricting cases?

21           A.   Yes, these are all redistricting cases.

22           Q.   And have you ever testified or submitted a

23      report as an expert in any non-redistricting cases?

24           A.   No.

25           Q.   Have you ever been an expert on behalf of
```

Page 28

```
 1      a defendant in a redistricting case?

 2           A.   Yes.

 3           Q.   Which case was that?

 4           A.   I think the Supreme Court of Pennsylvania

 5      case, Pennsylvania State House redistricting case

 6      is -- I think it was a defendant because I testified

 7      as expert witness for the legislative, the

 8      apportionment commission.

 9           Q.   Will you identify all the cases in this

10      paragraph that are racial gerrymandering cases.

11           A.   Okay.  So Alabama case is a racial

12      gerrymandering case, Congressional and also South

13      Carolina House, you know, South Carolina House,

14      State House case is also racial gerrymandering case.

15           Q.   Are the rest of the cases here in

16      paragraph 14 partisan gerrymandering cases?

17           A.   That's right.  I think so.

18           Q.   How about Jacksonville?

19           A.   Oh, Jacksonville is a racial

20      gerrymandering case.  Thank you.

21           Q.   So this case, Graham versus Adams in

22      Kentucky, is a partisan gerrymandering case; is that

23      right?

24           A.   That's correct.

25           Q.   Dr. Imai, are you a map drawer?
```

Kosuke Imai, PhD                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 29

```
 1          A.    No.
 2          Q.    Have you ever been qualified as an expert
 3    in map drawing?
 4          A.    No.
 5          Q.    Have you ever been disqualified as an
 6    expert witness?
 7          A.    No, not that I know.
 8          Q.    And in any case, have some or all of your
 9    expert opinions been found inadmissible by a court?
10          A.    Not that I know of.
11          Q.    All right.  I'd like to focus now on the
12    summary of opinions which starts on the page 4.
13    It's paragraph six to seven.
14          A.    Okay.  Hold on.  Page 4, okay.
15          Q.    And I believe your report analyzes the
16    South Carolina Congressional map enacted earlier
17    there year; is that correct?
18          A.    That's correct.
19          Q.    And I will generally refer to that map as
20    the enacted plan; does that make sense to you?
21          A.    That's how I refer to it so that works for
22    me.
23          Q.    Great.  Does your report examine whether
24    the enacted plan intentionally discriminates on the
25    basis of race?
```

Page 30

1          A.   Not the part intentional, no.

2          Q.   And so your report draws no conclusions

3     about intent; is that right?

4          A.   Right.  That's correct.  No opinion on

5     intent.

6          Q.   And your report -- does your report

7     conclude that race predominated over traditional

8     districting criteria in the enacted plan?

9          A.   No.

10         Q.   Why not?

11         A.   This is a statistical analysis and a

12    statistical evaluation so my analysis only addresses

13    whether race played a significant role in

14    determining the district boundaries in the enacted

15    plan, not the legal conclusion suggested by the

16    phrase, the predominant.

17         Q.   Paragraph seven, starting at the sentence

18    that carries over from page 4 to 5.

19         A.   Uh-huh.

20         Q.   Uses the word cracks and the word

21    cracking.  Do you see that?

22         A.   Yes.

23         Q.   How do you define cracking as that term is

24    use in your report?

25         A.   It's a simple definition that refers to

Page 31

1      splitting particular geographical area and that's

2      the definition.  Splitting into multiple districts.

3           Q.   So splitting a county, splitting any

4      county in South Carolina, does that constitute

5      cracking under your definition?

6           A.   I wouldn't call it cracking a county.

7      Usually I use cracking as particular group of orders

8      for living, you know, specific geography, so not so

9      much about administrative boundaries themselves.

10          Q.   Does cracking occur any time a group of

11     say black voters is divided into more than one

12     district?

13          A.   You may call that cracking.  I think in my

14     report you can, you know, think of cracking as just

15     a splitting a group of voters who live in, you know,

16     certain geographical area.  It has no legal or any

17     other meaning.

18          Q.   So what does -- in your report is there a

19     particular test for when cracking occurs or is it

20     simply the splitting of voters, like you just said?

21          A.   Splitting voters, you can test whether

22     that's unusual.  So you can test, use the

23     statistical test, to see if particular splitting or

24     cracking is unusual related to the simulated plans.

25          Q.   Did you conduct an effectiveness analysis

Kosuke Imai, PhD                                        August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 32

```
 1      on the enacted plan or in any of your simulation

 2      plans?

 3              A.   No, I did not.

 4              Q.   And did you analyze any election data in

 5      your report?

 6              A.   No, no.

 7              Q.   And did you analyze the political effect

 8      of any plan?

 9              A.   Would you clarify what you mean by

10      political effect?

11              Q.   Sure.  Well, for example, did you consider

12      whether districts were likely to elect a Republican

13      or a Democrat?

14              A.   Oh, no.

15              Q.   And did you consider partisan performance

16      in any district?

17              A.   No.

18              Q.   Now we talked a little bit before about

19      the methodology you used, I believe you gave some

20      detail on.  And I want to understand.  Let's turn to

21      paragraph 17 on page 7 of your report.

22              A.   Okay, hold on.  Yes.

23              Q.   I believe paragraph 17 says that you set

24      to generate a representative sample of all possible

25      plans that satisfy a specified set of criteria; is
```

Page 33

```
 1      that right?

 2           A.    That's correct.

 3           Q.    And how does your methodology ensure a

 4      representative sample?

 5           A.    Right.  So this is -- the algorithm that I

 6      use is merge-split type algorithm and it is a type

 7      of Markov chain Monte Carlo algorithm and this

 8      algorithm is a target distribution which is

 9      specified by, in this case, specifying the set of

10      constraints that are imposed in the algorithms and

11      once those constraints are imposed the algorithm has

12      a mathematical property that generates a

13      representative sample from that distribution that

14      you specified.

15           Q.    And is there anything that you do in your

16      methodology or through the algorithm to guarantee

17      that the set of simulation plans you end up with is

18      in fact a representative sample?

19           A.    So the guarantee comes from mathematical

20      property.  So there is a mathematical theorem that

21      gives mathematical guarantee.  And in addition, we

22      use standard diagnostics to ensure that the samples

23      that we generate is following what in the field

24      described as the best practice of using this type of

25      algorithm.
```

Page 34

```
 1        Q.   All right.  Dr. Imai, I'm going to pull up

 2   what is Exhibit Four.

 3             (Defendant's Exhibit No. 4, SEQUENTIAL MONTE

 4   CARLO FOR SAMPLING BALANCED AND COMPACT REDISTRICTING

 5   PLANS PAPER, was marked for identification.)

 6   BY MR. GORE:

 7        Q.   Tab four in your binder and it will also

 8   be numbered as Exhibit Four.

 9        A.   Okay, tab four.  Yes.

10        Q.   Now I uploaded it in Exhibit Share as

11   well.  Dr. Imai, do you recognize this document?

12        A.   Yes.

13        Q.   What is this document?

14        A.   This is a paper I've written on

15   redistricting simulation.

16        Q.   Has this paper been publashed?

17        A.   Not yet.

18        Q.   But you hope it will, right?

19        A.   Yes.

20        Q.   So I'd like to just walk through a couple

21   of points that you make in this paper.  So in the

22   abstract --

23        A.   Sure.

24        Q.   Is that -- well, let me back up.

25             So this paper is about sequential
```

Page 35

1        Monte Carlo method, right?

2              A.    That's correct.

3              Q.    And we talked about that earlier, that the

4        sequential method starts from a blank slate.

5              A.    That's right.

6              Q.    Whereas the Markov chain method starts

7        with an existing plan; is that correct?

8              A.    That's correct.

9              Q.    Are there any other differences between

10       sequential Monte Carlo method and the Markov chain

11       Monte Carlo method?

12             A.    I mean, there are a lot of differences

13       that, you know, in this application.  Just so the

14       most basic difference is this nature that sequential

15       Monte Carlo starts from a blank slate and start

16       building one district at a time.  And then once you

17       generate, you know, one -- so you basically generate

18       multiple plans in parallel.

19                   Whereas, Markov chain Monte Carlo

20       will generate multiple plans, not in parallel, but

21       in actually sequence.  So it start generating

22       multiple plans by modifying a plan, you know,

23       sequentially.  So even though sequential part is

24       used for the sequential Monte Carlo, Markov chain is

25       more independent.  So it starts from the existing

Page 36

 1    plan and then generating different -- start

 2    generating different plans by modifying it.

 3                   Whereas the SMC is really about

 4    starting from a blank slate and start building one

 5    district at a time.

 6         Q.   Thank you.  So I want to start with the

 7    third sentence in the abstract of this paper.

 8         A.   Okay.

 9         Q.   And I'm just going to read that out loud.

10    It says:  For successful application sampling

11    methods must scale to large maps with many

12    districts, incorporate realistic legal constraints

13    and accurately and efficiently sample from a

14    selected target distribution.  Unfortunately, most

15    existing methods struggle in at least one of these

16    areas.

17                   So my first question, Dr. Imai, did I

18    read that correctly?

19         A.   That's correct.

20         Q.   Do you agree that simulation analysis must

21    incorporate realistic legal constraints?

22         A.   I agree.

23         Q.   And the next sentence says that:  Most

24    existing methods struggle in at least one of these

25    areas.

Kosuke Imai, PhD                                            August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 37

```
 1          A.    Uh-huh.

 2          Q.    And are the existing methods referred to

 3    in this sentence, Markov chain Monte Carlo methods?

 4          A.    Included is Markov chain Monte Carlo

 5    algorithm.  That's not the only one, but yes.

 6          Q.    What other methods are included here?

 7          A.    There are enumeration algorithm, which

 8    simply enumerate all possible, you know,

 9    redistricting plans under certain set of

10    constraints.

11                    There are also something called

12    constructive Monte Carlo methods which often start

13    with a seed for each district.  So you pick -- if

14    you have six districts you pick six precincts, for

15    example, and then start growing a district from each

16    of those seed precincts.

17                    So there are different type of

18    algorithms out there other than the SMC and MCMC.

19    And that sentence, the existing methods include all

20    that.

21          Q.    And I'm going to skip down a couple of

22    sentences to a sentence that starts, because.

23                    Because it draws many plans in

24    parallel, the SMC algorithm can efficiently explore

25    the relevant space of redistricting plans better
```

Page 38

```
 1       than the existing Markov chain Monte Carlo, MCMC

 2       algorithms that generate plans sequentially.

 3                       Did I read that correctly?

 4           A.    You did.

 5           Q.    And so is it your view that SMC is better

 6       than the Markov chain Monte Carlo algorithm?

 7           A.    So I don't want to make general statement

 8       like that because even though, you know, in the

 9       abstract that's one way to summarize how the

10       sequential Monte Carlo improves upon the existing

11       methods.

12                       Depending on different cases,

13       especially the purpose of analysis, you know,

14       certain algorithm may do just fine and, you know,

15       certain algorithm may be more suitable than other

16       algorithms.  So I don't want you to think of this

17       statement applies generally to every single, you

18       know, redistricting analysis algorithms on that.

19           Q.    I'm going to scroll down to the next page

20       which I think is page 2 of the document or the PDF,

21       but it's page 1 in the footer.  It's the page after

22       the abstract.

23           A.    Oh, okay.  Okay.

24           Q.    And then it's the fourth paragraph down,

25       starts, MC algorithms.
```

Page 39

```
 1           A.    Yes.

 2           Q.    MCMC algorithms, citation, can in theory

 3      sample from a specific target distribution and

 4      incorporate constraints through the use of an energy

 5      function.  In practice, however, existing algorithms

 6      struggle to mix and traverse through a highly

 7      complex sampling space, making scale a bit difficult

 8      and accuracy hard to prove.  Some of these

 9      algorithms make proposals by flipping precincts at

10      the boundary of existing districts, rendering it

11      difficult or even impossible to transition between

12      points in the state space, especially as more

13      constraints are imposed.

14                     Did I read that correctly?

15           A.    Yes, you did.

16           Q.    And is that a valid criticism of MCM

17      algorithms?

18           A.    I think it's a valid general criticism of

19      the MCMC algorithm but I would like to emphasize

20      that depending on the specific use case, this

21      particular, you know, criticism may not apply.  So

22      it should be evaluated based on the specific use

23      case.

24           Q.    And is that point made in this paragraph

25      of the draft or elsewhere in the draft?
```

Page 40

```
 1           A.   I don't recall all the sentences I've

 2    written but, you know, this is a general point

 3    that's being made, not a criticism of specific

 4    applications per se.  So I think for any statistical

 5    analysis if you are criticizing a particular

 6    application of it, you would want to consider the

 7    specific factors that are relevant for that case.

 8                    You know, this is general weakness of

 9    the MCMC algorithms that are acknowledged in the

10    field but that doesn't mean that, you know, that the

11    application of it, all the applications of it are

12    automatically invalid and it needs to be -- the

13    validity of the application needs to be evaluated

14    case by case.

15           Q.   Dr. Imai, in light of these criticisms of

16    MCMC algorithms, why did you use that approach here

17    instead of SMC in your report?

18           A.   Okay.  There are several reasons.  First,

19    I'd like to point out that in the race-blind

20    simulations that I have conducted, so this is

21    referring to the first race-blind simulation which

22    basically generates the simulated boundaries between

23    districts one and six.

24                    And then the second race-blind

25    simulation which examines the District 1 within the
```

Page 41

1        Charleston County, okay.  So in these two race-blind

2        simulations, because there is only two districts are

3        in question, essentially the SMC and MCMC are very,

4        very similar.

5                        So if you recall, merge-split

6        algorithm, they merge two districts and then spread

7        them.  And SMC starts from blank slate and then

8        generate one district at a time.

9                        In these cases where you only have

10       two districts starting from the blank slate and

11       merging and then splitting is essentially the same.

12       So they are very, very similar in terms of the --

13       how the algorithm -- how the algorithm, you know,

14       progresses.

15                       And for the statewide analysis where

16       I analyze all districts at a time, there are

17       important differences, how the SMC handles that case

18       as well as MCMC handles that case.  But there I

19       wanted to impose the constraint that the District 6

20       has this VRA percentage, BVAP percentage, between 45

21       and 50 percent, and so in order to specify, to tell

22       the algorithm that District 6 should have that

23       percentage, it's better to use MCMC algorithm where

24       you start with existing primary states enacted plan,

25       which has a District 6 and then generate the new

Page 42

1      districts in sequence.

2                    Whereas, if you start from a blank

3      slate, it's a little bit more difficult to tell the

4      algorithm District 6 should have BVAP proportion or

5      percentage.  So it makes sense for that statewide

6      analysis to use the merge-split type of algorithm

7      and for the sake of consistency, I use the

8      merge-split algorithm in the race-blind simulation,

9      whereas, the rest difference between the use of SMC

10     and merge-split because there are only two districts

11     that are involved.

12          Q.    Could you have used the SMC algorithm for

13     your statewide simulations?

14          A.    It would have taken, you know, different

15     type of constraints.  I haven't -- you could try it.

16     I haven't tried that.

17          Q.    Is there any technical reason why that

18     would not be possible?

19          A.    I wouldn't say it's impossible because I

20     haven't tried it, but as I explained, SMC starts

21     from the blank slate and they build the district in

22     sequence, one by one.  And so to impose the VRA

23     constraints, which is basically pairing the

24     algorithm that the particular district should have

25     certain range of BVAP proportion, it's much easier

Page 43

1          to specify that constraint in the MSMC where you

2          start with existing plan that has District 6.

3               Q.    Dr. Imai, I'd like to go down to page --

4          it's page 3 of the draft article, it's the fourth

5          page.

6               A.    Okay.

7               Q.    In what I have sent you since the abstract

8          page is not numbered.

9               A.    Okay.

10              Q.    I just want to read some of this to you.

11         So the second-to-last paragraph, the last sentence

12         of that paragraph starts, however.

13                    However, these methodological debates

14         are also relevant for other cases where simulation

15         algorithms have been extensively used by expert

16         witnesses, citation, and highlight the difficulties

17         in practically applying existing sampling algorithms

18         to actual redistricting problems.

19                    Did I read that correctly?

20              A.    Yes.

21              Q.    And do you stand by that statement about

22         existing sampling algorithms?

23              A.    I stand by it but again, I have not

24         examined each application, you know, one by one, so

25         I cannot say anything about this specific, you know,

Kosuke Imai, PhD                                    August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 44

```
 1      case.
 2          Q.    And then I just want to read a couple more
 3      sentences.  It says:  First, the distributions that
 4      some of these algorithms sample from are not made
 5      explicit, leaving open the possibility that the
 6      generated ensemble is systematically different from
 7      the true set of all valid plans.  Second, even when
 8      the distribution is known, MCMC algorithms used to
 9      sample from it may be prohibitively slow to mix and
10      cannot yield a representative sample.
11                    Did I read that correctly?
12          A.    Yes, you did.
13          Q.    So in certain cases MCMC algorithms don't
14      yield representative samples; is that correct?
15          A.    That's correct.
16          Q.    In fact, in other cases or maybe even the
17      same cases MCMC algorithms can generate ensemble
18      plans or simulations that are systematically
19      different from the true set of all valid plans; is
20      that right?
21          A.    That's certainly a possibility.
22          Q.    I'd like to go back to the abstract
23      page and ask you about the first footnote which is a
24      star footnote where you thank a few people for input
25      on the draft.
```

Page 45

```
 1          A.    Yes.

 2          Q.    The first person is Ben Fifield.  Do you

 3    see that?

 4          A.    Yes, I do.

 5          Q.    And who is Mr. Fifield?

 6          A.    He was ACLU staff but more importantly, he

 7    was my former student from Princeton when I taught

 8    there and he was also a collaborator on some of

 9    these papers, not this one, but some of these

10    redistricting algorithm papers.

11          Q.    And approximately how many papers have you

12    collaborated with Mr. Fifield?

13          A.    Oh, I think two, at least two papers that

14    were published already and the software that I

15    developed, he was also involved in that development

16    at the earlier years, way back, you know, several

17    years ago, I think, or maybe ten even.

18          Q.    And do you know where Mr. Fifield works

19    now?

20          A.    I -- my understanding is that he left the

21    ACLU and went to Facebook but I'm not 100 percent

22    sure.

23          Q.    Have you discussed this case with him?

24          A.    Not about this case.

25          Q.    How about your expert report, have you
```

Page 46

1     discussed that with him?

2          A.   No.   Oh, just one clarification.   So he

3     was part of the -- some of the conversation I had

4     with counsel.   So I didn't discuss with him, you

5     know, just with him alone about this case but he was

6     present when I had a conversation about draft

7     reports with Mr. Cepeda and other lawyers so...

8          Q.   Did you have any conversations with

9     Mr. Fifield about any draft maps or plans for South

10    Carolina Congressional redistricting?

11         A.   I don't think so.

12         Q.   Did you receive any data from Mr. Fifield?

13         A.   I did receive the data from Mr. Fifield

14    through the email that -- where the -- my counsel

15    was also copied and through the SharePoint side that

16    they provided.

17         Q.   Other than the data that was provided with

18    counsel copied did you receive any other data from

19    Mr. Fifield?

20         A.   No.

21         Q.   Did Mr. Fifield provide you any

22    assumptions in this case?

23         A.   No.

24         Q.   I'm going to take down this exhibit for

25    now and if I can figure out how to do it I'd like to

Page 47

```
 1      bring up your report again.

 2            A.    Okay.

 3                  MR. GORE:  Adriel, can you see that in

 4      Exhibit Share?

 5                  MR. CEPEDA:  No.  I didn't have access

 6      when I tried.  I'm sorry, I can't answer your

 7      question at the moment.

 8                  MR. GORE:  I just want to make sure you're

 9      comfortable and you're able to follow along with all

10      these.

11                  MR. CEPEDA:  I'm following along with the

12      tabs so as long as you are saying where you are

13      looking at, I'm there.

14      BY MR. GORE:

15            Q.    Okay.  So back to the expert report which

16      is tab two.

17            A.    Yes.

18            Q.    And has previously been marked as Exhibit

19      Two.

20            A.    Right.

21            Q.    I would ask you some questions about this

22      but before I do so, Dr. Imai, did you run any

23      simulation analysis on the benchmark plan?

24            A.    I may have run it in the draft expert

25      reports that were included in the draft expert
```

Page 48

```
 1    reports.
 2          Q.   And what was the result of that simulation
 3    analysis?
 4                MR. CEPEDA:  John, I'm going to object to
 5    the extent that the question calls for the substance
 6    of a draft under -- that would be protected under
 7    Rule 26B.
 8                MR. GORE:  Okay.  Well, he said he ran the
 9    analysis but didn't report it.  I would like to know
10    why it's not in the report and if there is a reason
11    for that.
12                MR. CEPEDA:  Well, you are asking about a
13    draft report which the rules explicitly protect.
14                MR. GORE:  Well, I didn't ask about the
15    substance of the draft report, I asked about the
16    outcome of the analysis that your expert says he
17    ran.  We had this with Dr. Lieu last week.  He had
18    run some analyses that weren't in his report and he
19    told me what the results of those analyses were.
20                MR. CEPEDA:  All right.
21    BY MR. GORE:
22          Q.   So I'm just going to ask you, Dr. Imai,
23    what was the result of the simulation analysis you
24    ran on the benchmark plan?
25          A.   I don't recall the specific results.
```

Page 49

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 1           Q.   Did you get the same result from the

 2    simulation analysis on the benchmark plan that you

 3    got from the simulation analysis on the enacted

 4    plan?

 5           A.   Oh, it will be different.  I mean, once

 6    you add different constraint it will be a different

 7    result.

 8           Q.   And did your analysis show that the

 9    benchmark plan was an outlier with respect to

10    cracking of black voters?

11               MR. CEPEDA:  Same objection as before.

12    BY MR. GORE:

13           Q.   You can go ahead and answer.

14           A.   I didn't evaluate benchmark plan.  I may

15    have used benchmark plan as parts of algorithm but I

16    didn't evaluate directly the benchmark plan.

17           Q.   So what analysis did you do on the

18    benchmark plan?

19               MR. CEPEDA:  Same objection.

20    BY MR. GORE:

21           Q.   You can go ahead and answer.

22           A.   I was asked by lawyers to -- by counsel to

23    incorporate the benchmark plan in the simulation,

24    not to evaluate the benchmark plan because my

25    analysis focuses on the evaluation of enacted plan
```

Page 50

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 1      so...
 2           Q.   Well, let me ask the question this way,
 3      did you run your Markov chain Monte Carlo simulation
 4      on the benchmark plan?
 5           A.   Can you clarify what you mean by, on the
 6      benchmark plan?  I don't quite understand.
 7           Q.   Okay.  Well, I read your report to say
 8      that you ran a Markov chain Monte Carlo simulation
 9      on the enacted plan or in relation to the enacted
10      plan.
11           A.   That's not quite correct.
12           Q.   Okay.
13           A.   Because when you run the simulation
14      algorithm the enacted plan is not directly used.
15           Q.   Okay.
16           A.   You generate -- not directly used, right.
17      You generate the simulated plan under a set of
18      constraints.  And then once you generate those
19      simulated plans the next step is to compare those
20      simulated plans with the enacted plan.  And that's
21      where enacted plan comes in.
22           Q.   Okay.  So thank you for that
23      clarification.  So the simulation plans take, as I
24      understand it, the 2020 census data, for example,
25      and other constraints which we'll talk about that
```

Page 51

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1        you programmed the algorithm to consider, right?

2             A.    That's correct.

3             Q.    And that generates a set of simulation

4        plans; is that correct?

5             A.    That's correct.

6             Q.    And then you compare that to the enacted

7        plan; is that correct?

8             A.    That's right, that's right.

9             Q.    Okay.

10            A.    So that's where -- so the actual

11       generation of simulated plans does not directly

12       involve the enacted plan.  In my -- the one that I,

13       you know, the analysis that's presented in my

14       report.

15            Q.    Did you conduct any simulation using 2020

16       or 2010 census data which was the data used for the

17       benchmark plan?

18                  MR. CEPEDA:  Same objection.

19       BY MR. GORE:

20            Q.    You can answer.

21            A.    So in my draft report I may have included

22       the simulation results that you used the benchmark

23       plan.

24            Q.    And did you then compare those simulation

25       results to the benchmark plan?
```

Page 52

          1              MR. CEPEDA:  Same objection.

          2       BY MR. GORE:

          3          Q.   You can answer.

          4          A.   I -- I don't compare with the benchmark

          5       plan because my goal -- I didn't because my goal is

          6       not to evaluate the benchmark plan.

          7          Q.   So when you --

          8          A.   I evaluated the enacted plan.

          9          Q.   I've got it.  But when you ran the

         10       simulation set using the 2010 census data did you

         11       then compare that simulation set to the enacted

         12       plan?

         13              MR. CEPEDA:  Same objection.

         14       BY MR. GORE:

         15          Q.   You can answer.

         16          A.   Can you repeat that question again?  I'm

         17       not understanding.

         18          Q.   Certainly.  So as I understand it, your

         19       analysis really has two steps.  You generate a set

         20       of simulation plans and then you compare that set to

         21       the enacted plan and I believe what's in your

         22       report; is that correct?

         23          A.   That's in my report, yes, my final report.

         24          Q.   Okay.  And I think in your report we just

         25       discussed that you generated some simulation sets

Page 53

1      using 2020 census data --

2            A.    That's right.

3            Q.    Plus various constraints which we'll talk

4      about later.  And then you compared that simulation

5      set to the enacted plan?

6            A.    That's right.

7            Q.    Okay.  I just asked you if you ran the

8      simulation set using 2010 census data.

9            A.    I don't think so.  The census data I've

10     seen that, you know, the census data I used has been

11     always 2020.

12           Q.    Okay.

13           A.    That's the data that matter.

14           Q.    Okay.  So did you -- let me ask the

15     question again because I think the record may be

16     unclear on this point.

17                       Did you ever run a set for this case,

18     this report, did you ever run a simulation set using

19     2010 census data?

20           MR. CEPEDA:  Same objection.

21     BY MR. GORE:

22           Q.    You can answer.

23           A.    I mean, I may have run the simulation

24     analysis that used the benchmark plan so to that

25     extent, if you think of that as using the 2010

Page 54

1      census data, then the answer is yes.  But the

2      population data that I used always come from 2020

3      census because that's the data that matters

4      currently.

5           Q.   So the simulations that you ran using the

6      benchmark plan, how did those work?

7                MR. CEPEDA:  Same objection.

8      BY MR. GORE:

9           Q.   You can answer.

10          A.   So as part of the, you know, draft expert

11     report, I may have included a simulation analysis

12     that, you know, imposes some similarity to the

13     benchmark plan.

14          Q.   Would that --

15          A.   As additional constraint.

16          Q.   Okay.  And was that constraint an attempt

17     to control for preservation of cores of the

18     benchmark district?

19                MR. CEPEDA:  Same objection.

20     BY MR. GORE:

21          Q.   You can answer.

22          A.    I was asked by counsel to perform that

23     analysis and I normally don't, you know, use any

24     plan including the previous plan in my redistricting

25     analysis because, you know, it will contaminate

Page 55

1       the -- it basically prevents me from isolating the

2       role that race play and redrawing the boundaries of

3       the districts in the enacted plan when you include

4       some information, include any plan that for all the

5       factors that affected it.

6                       So that's the reason why I don't in

7       general use the previous plans or any other plan to

8       construct my -- directly construct my algorithm

9       constraints.

10                      But I recall that the draft expert

11      reports may have included analysis that put some

12      constraints with respect to the benchmark plan upon

13      the request of counsel.

14          Q.    Okay.  And was that an effort to control

15      for the shape and location of the benchmark

16      districts and how that might have affected the

17      enacted plan?

18                MR. CEPEDA:  Same objection and also now

19      calling for attorney-expert communication.

20                MR. GORE:  Are you instructing him not to

21      answer?

22                MR. CEPEDA:  I'll let it but I'm lodging

23      the objection.

24                MR. GORE:  Thank you.

25      BY MR. GORE:

Page 56

```
 1        Q.   Go ahead, Dr. Imai, you may answer.
 2        A.   I don't -- because it was a suggestion by
 3   counsel, I don't know exactly what the, you know,
 4   real goal of that particular analysis.  But from my
 5   point of view that because it would prevent me from
 6   isolating the role the race plays in redistricting
 7   plan, I don't directly incorporate any plan in my
 8   algorithm constraints including the previous, you
 9   know, benchmark plan.  And that's why in the final
10   report it's not there.
11        Q.   And you include other constraints in your
12   simulation set, correct?
13        A.   That's correct.
14        Q.   And those other constraints such as
15   contiguity or incumbency pairings don't prevent you
16   from isolating the role of race, correct?
17        A.   That's correct to the extent that those
18   factors are controlled, right.  Like I don't want to
19   consider noncontiguous districts or the districts
20   that have a large population deviation.
21        Q.   So --
22        A.   I would want to exclude those.
23        Q.   Why does including or why did including
24   the benchmark plan-related constraints prevent you
25   from isolating the role that race played in the
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Page 57

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 1     enacted plan?

 2               MR. CEPEDA:  Object to form.

 3     BY MR. GORE:

 4          Q.   You can answer.

 5          A.   Yeah, so the reason is that benchmark plan

 6     may be based on a set of unknown factors that I just

 7     don't know what factors went into create the

 8     benchmark plan and one of those factors could be

 9     race or it could be some other factors.  And if I

10     really want to isolate the role of the race I know

11     what I include is unknown, you know, set of factors

12     that may influence my results.  Whereas, the

13     population and contiguity, I know exactly what they

14     are so I impose them.

15          Q.   Did you --

16          A.   I don't want noncontiguous districts.

17          Q.   And do you have any reason to believe that

18     the benchmark plan violated traditional districting

19     principles?

20               MR. CEPEDA:  Object to the form.

21               THE WITNESS:  I don't evaluate benchmark

22     plans so I don't form any opinion on benchmark plan.

23     BY MR. GORE:

24          Q.   How is the benchmark plan-related

25     constraint different from the other constraints you
```

Page 58

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 1      imposed in your report?
 2           A.   As I said, the benchmark plan is perhaps
 3      created based on a number of factors that I don't
 4      know what they are because I don't evaluate the
 5      benchmark plan.  My goal has been to evaluate the
 6      enacted plan so if I directly impose the benchmark
 7      plan in my algorithm as a constraint I would be
 8      inheriting a number of unknown factors that
 9      influence the benchmark plan which would prevent me
10      from drawing any conclusions about the role race
11      played in drawing the district in the enacted plan.
12           Q.   Well, what if the map drawer had started
13      with the benchmark plan when drawing the enacted
14      plan, wouldn't that affect the set of plans from
15      which the map drawer was drawing?
16           A.   How the map drawer drew the enacted plan
17      doesn't affect my analysis.  My analysis is
18      completely independent of exact intention or
19      anything that the map drawer has had.  The goal is
20      just to only evaluate the enacted plan that resulted
21      in the process.
22           Q.   So it doesn't matter to your analysis
23      whether the map drawer drew the enacted plan based
24      on the benchmark plan; is that right?
25           A.   I did not evaluate whether the map drawer,
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Page 59

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 1      you know, what information the map drawer used to

 2      draw enacted plan.  My evaluation is really just

 3      about the final enacted plan, the characteristics of

 4      it and then specifically the role race played in the

 5      final product.  And that's really the goal.  It's

 6      just not my goal to understand how map drawer drew

 7      the enacted plan.

 8           Q.   So after you generated the simulation set

 9      that included the benchmark plan-related

10      constraints, did you compare that set to the enacted

11      plan?

12               MR. CEPEDA:  Object to form;

13      mischaracterizes testimony and asking for questions

14      about the draft protected by Rule 26.

15               MR. GORE:  Again, I'm not asking about the

16      draft, I'm asking about the analysis.

17      BY MR. GORE:

18           Q.   So Dr. Imai, I believe you can answer.

19           A.    In the draft expert report the results may

20      have been included but I don't recall specifics.

21           Q.   And no such results are included in your

22      final report; is that correct?

23           A.    What do you mean by such results?

24           Q.   You don't, your expert report doesn't

25      contain a simulation set with a benchmark
```

Page 60

1      plan-related constraint, right?

2           A.    That's correct.

3           Q.    Do you recall what the benchmark

4      plan-related constraint was in the analysis that you

5      ran that included that constraint?

6               MR. CEPEDA:  Same objection as above.

7               THE WITNESS:  There are several ways to do

8      that but I don't recall which one I used.

9      BY MR. GORE:

10          Q.    What are some of the possible ways to do

11     that?

12          A.    Like one possible way is to look at the

13     geographical overlap.  Another possible way is to

14     look at the population overlap, although one has to

15     be very careful about this because people have moved

16     over the past ten years.  So the fact that there is

17     a number of people in a certain location may not

18     necessarily, you know, reflect the people who've

19     been living there for the last decade.

20          Q.    Okay.  So other than geographical overlap

21     and population overlap, are there any other ways to

22     control for the benchmark plan or any other

23     benchmark plan-related constraints that would be

24     possible in your simulation model?

25          A.    So in my simulation model the incumbency

Page 61

1     regions restraint is imposed so that also partially,

2     you know, controls for the overlap, if you -- if you

3     make sure that incumbency won't be paired in each

4     district that will to some extent have some

5     implications on the overlap with the benchmark plan.

6                    In my race-blind analysis I basically

7     only look at two districts so to the extent that the

8     rest of the districts are untouched, they are the

9     same as, you know, benchmark plan.  And in my second

10    race-blind simulation I freeze even the District One

11    Six boundary outside of Charleston County, so to the

12    extent that, you know, that part is following the

13    boundary of -- under the benchmark plan or the

14    enacted plan.  The enacted plan is similar to the

15    benchmark plan.

16                    You know, there are implications in

17    the overlap but I don't want to use the benchmark

18    plan directly in my constraint because it inherits

19    all sorts of factors that I don't know and basically

20    my analysis.

21         Q.    Okay.  Is it possible that some of those

22    factors the benchmark plan inherits are not related

23    to race?

24         A.    It's possible.  Again, I didn't evaluate

25    the benchmark plan, that was never the goal of my

Page 62

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 1      analysis so I don't know what factors went into the

 2      benchmark plan and precisely for that reason I don't

 3      want to include it.

 4           Q.    And my final question, what -- on this for

 5      now, what was the benchmark plan-related constraint

 6      in your simulation analysis that you ran?

 7               MR. CEPEDA:  Object to form and object

 8      because it asks the question about the draft

 9      protected under Rule 26.

10               MR. GORE:  Again, I'm not asking about the

11      draft.  I'm asking about the analysis you ran,

12      Dr. Imai.

13               MR. CEPEDA:  Dr. Imai has referenced that

14      he conducted the analysis as part of a draft report

15      several times.

16               MR. GORE:  The fact that it's in a draft

17      doesn't insulate it from discovery if it's an

18      analysis he did.

19      BY MR. GORE:

20           Q.    So Dr. Imai, go ahead.

21               MR. CEPEDA:  We can disagree about that,

22      John.

23               MR. GORE:  I imagine we will.  Thank you.

24      BY MR. GORE:

25           Q.    Dr. Imai, can you answer the question?
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Page 63

1            A.   Yes.  So there are two possible ways to

2     impose the overlap constraint with respect to the

3     benchmark plan, as I explained to you, geography or

4     population based.  There might be some other ways

5     but those are the two that were part of the software

6     factors that I used in my own software case, and I

7     don't recall which one I used.  I'm sorry.

8            Q.   And do you recall the results of comparing

9     that simulation to the enacted plan?

10               MR. CEPEDA:  Same objection.

11               THE WITNESS:  I may -- again, the draft

12     expert report may have included the comparison but I

13     don't recall the specific results.

14     BY MR. GORE:

15           Q.   And I want to ask you a few more questions

16     about your report.  So the simulation analysis

17     that's in your report does not include the benchmark

18     plan-related constraint, correct?

19           A.   That's correct.

20           Q.   Okay.  Did you ever compare any of those

21     simulations to, for example, any of the plans

22     proposed by members of the public during the

23     Congressional redistricting process?

24           A.   No.

25           Q.   So you didn't ever compare that to the

Page 64

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 1      NAACP plan one, for example?

 2           A.   I didn't have access to those, yeah.

 3           Q.   So you didn't compare to NAACP Plan Two

 4      either; is that right?

 5           A.   No, I didn't do that.

 6           Q.   Or the League of Women Voters' plan?

 7           A.   No.

 8           Q.   Or the Harpootlian plan?

 9           A.   No.

10           Q.   And so the analyses you ran were a local

11      simulation of District 1 and 6; correct, was the

12      first one?

13           A.   Yeah.  The first one, yeah.

14           Q.   And the second one was a local simulation

15      of Districts 1 and 6 limited to Charleston; is that

16      correct?

17           A.   Yeah, that's right.  That's the second

18      one.

19           Q.   And the third is a statewide simulation;

20      is that correct?

21           A.   That's correct.

22                MR. GORE:  At this point we have been

23      going an hour and a half.  Let's go off the record.

24                    (A recess was taken.)

25      BY MR. GORE:
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Kosuke Imai, PhD                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 65

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 1        Q.   So bear with me for on second if you would

 2   be so kind.  Okay.  I'd like to go to what's marked

 3   as tab three.

 4        A.   Tab three.  Okay.

 5        Q.   In your zip.

 6        A.   Yes.

 7        Q.   I will go ahead and mark that as Exhibit

 8   Five.

 9             (Defendant's Exhibit No. 5, RECOMBINATION: A

10   FAMILY OF MARKOV CHAINS FOR REDISTRICTING ARTICLE, was

11   marked for identification.)

12   BY MR. GORE:

13        Q.   I have loaded it into Exhibit Share and

14   now hopefully we are going to display.  And I

15   believe this is an article called Recombination:  A

16   Family of Markov Chains for Redistricting; is that

17   right?

18        A.   Yes.

19        Q.   And I'm not even going to ask you to

20   explain what those words mean.  Thank you for

21   confirming.  I'd like to go to page 41 of this

22   article, if we might.

23        A.   Forty-one, okay.  Hold on.  Yes.  Okay,

24   yes.

25        Q.   Thank you.  And I believe there is a
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Page 66

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 1     sentence here that I would like to explore with you

 2     for a moment.  So it's the first full sentence on

 3     the top of page 41, it starts, Comparator plans.

 4               Comparator plans must be legally

 5     viable and pragmatically plausible to draw power

 6     from the conclusion that a proposed plan has very

 7     different properties.

 8               Did I read that correctly?

 9          A.   Yes.

10          Q.   And I believe this article was listed on

11     your reliance list.  Do you agree with that

12     statement?

13          A.   I have no opinion.  I did not form opinion

14     on this particular sentence.

15          Q.   Okay.  Let me ask it this way.  Regardless

16     of what the sentence says, do you agree that for

17     simulation plans to tell you something about the

18     enacted plan, the simulation plans have to be

19     legally viable and pragmatically plausible?

20          A.   I don't know what they mean by those words

21     so I can't really form opinion on that particular

22     sentence.

23          Q.   Let me ask it this way.  Forget about that

24     sentence.  I'm going to take that down.

25          A.   Okay.
```

Page 67

1         Q.    Do you agree that for simulation plans to

2     be instructive they have to comply with legal

3     requirements for redistricting plans generally?

4         A.    I disagree.

5         Q.    Explain that, please.

6         A.    Simulations can be used in many different

7     purposes.  So for example, you could see the impact

8     of, you know, what would happen if you take out one

9     particular requirement.  And so depending on the

10    goal of the analysis, a different set of constraints

11    can be imposed.

12                    And also, I'm not a lawyer so I don't

13    really make judgment about whether those

14    constraints, how they correspond to the legal

15    requirements.  They are informed by legal

16    requirements but I don't make any judgment about the

17    viability in the legal sense.  The constraints are

18    mathematical constraints and they are what they are.

19    Nothing more, nothing less.

20        Q.    So is it fair to say, Dr. Imai, that you

21    did not analyze whether any of your simulation plans

22    are legal?

23        A.    I'm not a lawyer so my analysis does not

24    draw any legal conclusions.

25        Q.    Okay.  And I just understand the scope of

Page 68

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 1     your analysis.

 2          A.   Right.

 3          Q.   You didn't do anything to try to determine

 4     whether your plans were legal, correct?

 5          A.   Yeah.  No, I didn't do that.

 6          Q.   Now, Dr. Imai, I believe your report

 7     mentions the South Carolina House and Senate

 8     redistricting criteria; is that right?

 9          A.   That's correct.

10          Q.   So let's go to tab five of your binder.

11          A.   Okay.

12          Q.   Which is the House Redistricting Criteria.

13          A.   All right.  Tab five.  Okay.  House, yes.

14     Okay.

15          Q.   And I'm going to mark this as Exhibit Six.

16               (Defendant's Exhibit No. 6, SOUTH CAROLINA

17     HOUSE OF REPRESENTATIVES JUDICIARY COMMITTEE

18     REDISTRICTING AD HOC COMMITTEE 2021 GUIDELINES AND

19     CRITERIA FOR CONGRESSIONAL AND LEGISLATIVE

20     REDISTRICTING, was marked for identification.)

21     BY MR. GORE:

22          Q.   And I hope I can figure out how to

23     introduce it.  Okay.  Dr. Imai, do you recognize

24     this document?

25          A.   Yes.
```

Page 69

1          Q.   And what is this document?

2          A.   This is the redistricting guidelines for

3     South Carolina House of Representatives

4     Redistricting Committee.

5          Q.   And did you review this document as part

6     of preparing your expert report?

7          A.   Yes, I received this document from

8     counsel.

9          Q.   I'm going to take that down and I'm going

10    to ask you about tab six in your binder.

11         A.   Okay.  It's open.

12         Q.   Great.  I'm going to mark this as Exhibit

13    Seven.

14              (Defendant's Exhibit No. 7, 2021

15    REDISTRICTING GUIDELINES SOUTH CAROLINA SENATE

16    JUDICIARY COMMITTEE REDISTRICTING SUBCOMMITTEE, was

17    marked for identification.)

18    BY MR. GORE:

19         Q.   And introduce it in Exhibit Share.  Do you

20    recognize this document?

21         A.   Yes.

22         Q.   And what is this document?

23         A.   This is the redistricting guideline for

24    Senate Judiciary Committee.

25         Q.   And did you review this document?

Page 70

1        A.    Yes, I received it from counsel.

2        Q.    Okay.  We'll refer to both of those

3    documents a little bit later.

4        A.    Okay.

5        Q.    I'd like to turn back to your expert

6    report.

7        A.    Okay.

8        Q.    And ask you a few questions about that

9    before we break.  And I'd like to start with

10   paragraph 20.

11       A.    Okay.

12       Q.    Which is on page 8.

13       A.    Yes.

14       Q.    And we may also talk about paragraph 22

15   which starts on page 9 and carries over to page 10.

16       A.    Uh-huh.

17       Q.    Both page 20 and page 22, excuse me, list

18   as one of your criteria that all districts are

19   geographically contiguous; is that right?

20       A.    That's correct.

21       Q.    And how did you -- how did you program the

22   algorithm to guarantee that districts are

23   contiguous?

24       A.    Would you want the technical explanation?

25       Q.    I guess I'd just like to understand.

Page 71

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 1          A.   Okay.
 2          Q.   Let me ask you this, does the algorithm
 3     consider water-to-water contiguity to be
 4     permissible?
 5          A.   Yes.
 6          Q.   How about point-to-point contiguity?
 7          A.   No.
 8          Q.   Are all of the districts in all of your
 9     simulation plans contiguous?
10          A.   From that point of view, yes, from that
11     definition, yes, based on that definition.
12          Q.   Based on that definition?
13          A.   Yes.
14          Q.   So they are contiguous but don't use
15     point-to-point contiguity; is that right?
16          A.   That's correct, yes.
17          Q.   Okay.  And the next factor is, you say you
18     program all relevant districts not to exceed an
19     overall population deviation of plus or minus
20     .1 percent; is that right?
21          A.   That's correct.
22          Q.   And that's 730 people, I think,
23     approximately, according to footnote three; is that
24     right?
25          A.   That's my understanding, yes.
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Page 72

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 1              Q.    You would agree with me though that this

 2       deviation is greater than what the House guidelines

 3       or the Senate guidelines permit, right?

 4              A.    Yes.

 5              Q.    And do you recall what the House

 6       guidelines and Senate guidelines say about equal

 7       population?

 8              A.    I don't recall exact language but...

 9              Q.    Do you recall what the requirement was for

10       equal population in those guidelines?

11              A.    So I don't recall exact language.

12              Q.    Okay.  That's no problem.  It's not a

13       memory test.  So let's flip back to Exhibit Six, tab

14       five which is the House redistricting criteria.

15              A.    Okay, hold on.  Tab five, okay, yes.

16              Q.    All right.  So this is the House criteria?

17              A.    Uh-huh.

18              Q.    And roman numeral four is equal population

19       slash deviation?

20              A.    Right.

21              Q.    And letter B says:  The number of persons

22       in Congressional districts shall be as nearly equal

23       in population as is practicable.  The ideal

24       population for Congressional districts shall be

25       731,204.  In every case efforts shall be made to
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Page 73

1      achieve strict equality or produce the lowest

2      overall range of deviation possible when taking into

3      consideration geographic limitations.

4                    Did I read that correctly?

5           A.   That's correct.

6           Q.   Okay.  And now if you will turn to tab six

7      which has been marked as Exhibit Seven, this is the

8      Senate guidelines.

9           A.   Right.

10          Q.   Do you have that in front of you?

11          A.   Yes.

12          Q.   And roman numeral one says:  Requirements

13     of federal law.  And A is population equality.  Two

14     is congressional districts.  And it says, under the

15     apportionment clause of Article One, Section Two of

16     the U.S. Constitution:  Any population deviation

17     among congressional districts, no matter how small,

18     must be justified through a showing that the

19     specific deviation is required by legitimate

20     redistricting policies such as making districts

21     compact, respecting political subdivision

22     boundaries, preserving the course of prior districts

23     and avoiding contest between incumbent

24     representatives.  So that the state may avoid

25     assuming this additional burden under federal law, a

Page 74

1      congressional redistricting plan should not have

2      population deviations greater than one person.  Is

3      that correct?

4             A.    That's correct.

5             Q.    So if we turn back to your expert report.

6             A.    Uh-huh.

7             Q.    Paragraph 20 and paragraph 22, you use the

8      constraint of plus or minus 0.1 percent, correct?

9             A.    That is right.

10            Q.    And that's greater than what the --

11     certainly what the Senate guidelines permitted

12     because Senate guidelines said the deviation should

13     be no greater than one person; is that correct?

14            A.    That's correct.

15            Q.    Why did you use 0.1 percent as your

16     constraint rather than one person?

17            A.    The reason is that my simulation is based

18     on the present level data.

19            Q.    Can you elaborate on that?

20            A.    So the precinct is much later greater than

21     the census blocks which typically are used as units

22     for actually doing the enacted plan and because a

23     precinct has on average the population of a couple

24     thousand often and there is a variation depending on

25     the precincts you are looking at.

Page 75

 1                        And so its appropriate to use the

 2      population deviation that corresponds to that

 3      particular size.

 4           Q.   Would it have been possible for you to

 5      program the algorithm to avoid a population

 6      deviation of greater than one person?

 7           A.   I think that would be difficult given the

 8      current state of algorithm development except you

 9      can always take a simulated plan that's generated

10      using the precinct level data and modify the

11      boundaries of the district to equalize the

12      population.  You know, you can do that.

13                        But automatically generating at the

14      census block level is -- is one -- there is no

15      reason to do that and I can elaborate why there is

16      no reason to do that.  And two, even if you wanted

17      to do it, it's not, you know, necessarily simple.

18           Q.   And I think you said that you can take a

19      plan generated through your method and equalize the

20      population after the fact, correct?

21           A.   Right, that's one possibility as opposed

22      to generate directly sampling the plans as the

23      census block level because there are many, many more

24      census blocks than precincts in any given state.

25      And I can explain why, you know, one should use

Page 76

1       precincts rather than census blocks.

2            Q.    Why don't you -- tell me why you used

3       precincts as opposed to census block?

4            A.    All right.  So first thing that's very

5       important is that I'm not trying to generate the

6       plan that can be enacted, like I'm not trying to be

7       automated map drawer.  Like, my goal is to evaluate

8       the characteristics of the enacted plan.

9                      So in this case, I'm -- the goal is

10      really to analyze the role that race played in

11      drawing the district, the boundaries of districts in

12      the enacted plan.  So for that purpose, the

13      equalizing the few hundred people -- and that's the

14      maximum deviation -- so a lot of simulated plans

15      have actually fewer deviation, it's not going to

16      affect the substantive conclusions that I draw from

17      the simulation analysis.

18                      If you look at the results they are

19      not different by a few hundred people, the

20      difference is way, way diverse.  So adjusting the

21      population deviation is not going to change.

22                      The other reason is that one of the

23      things that guideline mentions is a preservation of

24      the precincts and so it also makes sense to keep

25      that simulation at the precinct level as opposed to

Page 77

```
 1      census block level.
 2           Q.    Thank you for all that.  Did you in your
 3      report otherwise ever try to equalize the population
 4      on any of your simulation plans?
 5           A.    No.
 6           Q.    Or did you just take them as they were?
 7           A.    No, I did not try to equalize them.
 8                 MR. GORE:   Let's go off the record for a
 9      minute.
10                      (A recess was taken.)
11      BY MR. GORE:
12           Q.    Dr. Imai, did you discuss your deposition
13      with anyone during the break?
14           A.    No.
15           Q.    I'd like to go back to your expert report.
16      At the break we were discussing paragraphs 20 and 22
17      where you list some of the principles that you used
18      for your simulation.  And we talked about contiguity
19      and equal population.
20                      The next few bullets in both of those
21      paragraphs 20 and 22 say:  No incumbent is paired
22      with another incumbent.  All the relevant districts
23      are on average at least as compact as the enacted
24      plan.  The number of split counties is on average no
25      greater than the corresponding number under the
```

Page 78

1         enacted plan.  And the number of split

2         municipalities is on average no greater than the

3         corresponding number under the enacted plan.

4                    So I'd like to walk through each of

5         these factors but before I do so, did you program

6         constraints for each of these factors in your

7         simulations?

8              A.   Can you clarify what you mean by, did you

9         program?

10             Q.   Or did the algorithm operate subject to

11        constraints for each of these factors?

12             A.   So each of these factors, basically that

13        you can instruct algorithm to discourage or

14        encourage certain type of plans.  So for example,

15        for the no incumbent pairing constraint I encouraged

16        algorithm not to sample the plans that paired

17        incumbents in some districts.

18             Q.   Let's turn to page 25 of your report.

19             A.   Okay.

20             Q.   I'd like to ask you about paragraph 57 on

21        page 25.

22             A.   Yes.

23             Q.   Okay.  You mention a couple of different

24        kinds of constraints in this paragraph.  I'd like to

25        understand what they mean.  First, what is a

Page 79

1       hierarchical constraint?

2           A.   Oh, hierarchical constraint is a

3       constraint that, you can think of it as a hard

4       constraint which limits the number of counties,

5       county splits to basically like total number of

6       districts minus one.  So which in this case is six.

7                       So this can be done in the process of

8       splitting the merged district into two districts.

9       So if you recall, the merged split algorithm merges

10      two adjacent districts and then splits, merge

11      district into two new districts.  And when you do

12      that you can make sure that you only split county

13      boundary once which basically effectively limits the

14      number of counties being split to six which is equal

15      to the total number minus one.

16                      So it's a hard constraint.  So you

17      can think of it as every simulated plan has this

18      property.

19          Q.   What is a soft constraint?

20          A.   Soft constraint has a weight parameter and

21      it encourages or discourages certain type of plans

22      so it doesn't ensure that all the plans satisfy

23      particular constraints.  So for example, incumbency

24      pairing avoidance is a soft constraint so some of

25      the plan that we sample pairs incumbents, it's a

Page 80

1      very small number.  And what I do is basically drop

2      those, you know, plans that don't satisfy the

3      constraint afterwards.

4                  But during the sampling process it's

5      using a soft constraint which, you know, discourages

6      the plans that pair incumbents in some districts.

7           Q.   Okay.  Paragraph 57 of your report assigns

8      certain strengths to certain constraints.  So for

9      example, you have a default compactness of strength

10     one and there are other numbers in here.  Just, can

11     you explain to me what the strength of the

12     constraint is?

13          A.   Right.  So the strengths of the constraint

14     is used for the soft constraint where the algorithm

15     is instructed to discourage or encourage certain

16     type of plans.  And so that strength of the

17     constraints basically tells us how strong that

18     discouragement or encouragement is in the

19     implementation of the algorithm.  It's a parameter

20     that controls that strength.

21          Q.   So for each of these factors in

22     paragraph 57, how did you choose the strength of the

23     constraint?

24          A.   So this is case-by-case, you know, choice

25     so you, given this particular, each specific

Page 81

```
 1      analysis you choose these parameters such that a set

 2      of, you know, certain goals and criteria are being

 3      met.  So for example,l if I want to ensure that

 4      incumbency is not paired in any district, if I

 5      choose the constraint that is too, you know, soft

 6      constraint that is too weak, I would end up with

 7      many plans that pair incumbents.  So I increase it

 8      until I eliminate pretty much most of the incumbency

 9      avoidance.  And of course, I have to do this while

10      making sure that other properties of the simulated

11      plans are satisfied as well.

12          Q.    So let me ask you a question as an

13      example.  In the localized Charleston County

14      simulation you raised the compactness constraint to

15      1.07, according to this paragraph.  Why choose 1.07

16      as opposed to 1.2 or 1.35 or something else?

17          A.    Uh-huh.  So the default parameter value

18      for this is one.  There are mathematical reasons

19      that particular default value is convenient for the

20      sampling algorithm.

21                        And if I wanted to make sure that the

22      plans are more compact, so this is relative value so

23      it's a reactive strength.  And the reason why I

24      raised it is because when I run it with constraint

25      of strength one that's a default value, it's less
```

Page 82

```
 1      compact.

 2                     And in many cases, not all of the

 3      cases, many of the simulated plans are less compact

 4      than enacted plan so I wanted to make sure that the

 5      simulated plans are, you know, equally compact when

 6      compared to the enacted plan.  That's why I raised

 7      that value, the encouraged, the simulation algorithm

 8      to sample more compact plan.

 9         Q.    How do you know that the precise strength

10      you have selected is the right strength for that

11      constraint in your model?

12         A.    So you can basically run a simulation with

13      different values and then see what the compactness

14      of the simulated plans are.

15         Q.    So in your model does changing the

16      strength of the constraint change the sample of

17      plans that the simulation generates?

18         A.    That's correct.  So changing the values of

19      parameters will change the distribution, the target

20      distribution.  Hence it would change the output,

21      simulated output.

22         Q.    And would that be true if one of the

23      factors, the strength of one factor was changed

24      within the constraints?

25         A.    Yeah.  Like any factor that -- of the
```

Page 83

```
 1      constraint if you choose that it's -- it's empirical

 2      question, it's possible that it would change the

 3      simulated plans as well.

 4           Q.   Same if you change the strength or two or

 5      more of the constraints?

 6           A.   Yeah, that's correct.

 7           Q.   Or all of the constraints?

 8           A.   That's correct.

 9           Q.   Do the strengths of the constraints you

10      selected approximate the constraints followed by the

11      general assembly in the enacted plan?

12           A.   No.  In the sense that I don't -- my goal

13      is not to -- you know, my constraints are informed

14      by these guidelines and then traditional

15      redistricting criteria.  But they are not designed

16      to mimic the way that the map drawers created these

17      maps.

18           Q.   So if the general assembly had assigned a

19      different strength to these constraints it would

20      have been working off of a different universe of

21      potential plans, right?

22           A.   Well, my understanding is the general

23      assembly doesn't use the algorithm.  So I'm not sure

24      what do you mean by, if the general assembly changed

25      the strength?  Different constraints, strength
```

Page 84

```
 1     constraints.
 2          Q.   Yeah, that's a fair question.  So would
 3     you agree that compliance with these principles
 4     requires tradeoffs or can require tradeoffs between
 5     various of the principles?
 6          A.   In some cases there are tradeoffs.  In
 7     other cases the tradeoff is not very strong.
 8          Q.   And if the general assembly weighted
 9     certain factors more heavily than your model it
10     would have come up with a different plan than your
11     model, right?
12          A.   I mean, again, I don't think that my model
13     would inform how the general assembly came up with a
14     plan but it's certainly the case that if you change
15     the parameters of my model that would result in
16     different simulated plans.
17          Q.   Okay.  So let's walk through each of these
18     factors and some of the constraints that you used,
19     if that's okay.
20          A.   Sure.
21          Q.   So incumbency pairing, I'm still in
22     paragraph 57 on page 25, it looks like for the
23     localized District 1 and 6 simulation, an incumbency
24     pairing avoidance constraint of strength one was
25     used.
```

Page 85

```
 1            A.    Uh-huh.

 2            Q.    Is that one value out of another number or

 3      what does that -- how do I understand that number?

 4            A.    Yes, so this is a reductive value so the

 5      reason you need a scale that tells you what one is,

 6      it really depends on the data that you are analyzing

 7      as well as other parameters that you are specifying.

 8                        So, you know, one doesn't nearly have

 9      intuitive meaning in the model, it's a relative

10      strength so the higher this value is, you know, the

11      stronger the constraint is and lower this value is,

12      the weaker the constraint.

13            Q.    And so --

14            A.    Yeah.

15            Q.    I'm sorry, I didn't mean to cut you off.

16            A.    All this is meant to say that the zero

17      means no constraint.

18            Q.    So in the statewide VRA simulation --

19            A.    Uh-huh.

20            Q.    I notice that your incumbency pairing

21      avoidance constraint had a strength of eight.  Is

22      that a stronger constraint than the constraint of

23      one in the other simulation that we were just

24      discussing?

25            A.    So you can't really compare the statewide
```

Page 86

```
 1       simulation with the two-district simulation because

 2       now the data are very different and we have

 3       different number of districts and there are many

 4       other factors that are different.

 5                      So this number, say one or eight,

 6       needs to be understood within the particular

 7       simulation context as opposed to comparing that

 8       number across different simulation analysis.

 9          Q.   Okay.  Thank you for that clarification.

10       I think you mentioned before that none of your

11       simulation plans pair incumbents; is that correct?

12          A.   That's correct.  But, you know, after

13       dropping a small number of simulated plans that do

14       pair incumbents, so because of the constraints that

15       reduced the number of simulated plans that pair some

16       incumbents, but in the final analysis simulated

17       plans, the simulated plans that I used for the final

18       analysis I dropped those small number of plans so

19       none of those plans I used for the final analysis

20       has incumbent pairing.

21          Q.   So help me make sure that I got this

22       right.  Because the incumbency pairing constraint is

23       a soft constraint, when you run the simulation, the

24       simulation will generate some plans that pair

25       incumbents somewhere?
```

Page 87

```
 1              A.    Yeah.

 2              Q.    Did I have that right so far?

 3              A.    It may or may not.

 4              Q.    Okay.

 5              A.    It may or may not, yeah.

 6              Q.    Fair?

 7              A.    But it's possible.

 8              Q.    And to the extent it did so here, you just

 9      went through and eliminated those plans from your

10      simulation set; is that right?

11              A.    That's right.  That's right.  It was very

12      small number, it was very trivial number.

13              Q.    Yeah, not to hold you to this, but can you

14      quantify it for me either in a number of plans or

15      like a percentage that might have generated

16      incumbency pairings?

17              A.    I don't recall that.

18              Q.    Okay.  Now in each of your simulation

19      plans you give the district number, the number for

20      the incumbent's district in the enacted plan,

21      correct?

22              A.    That's correct because the simulated plan

23      has no pairings so I can use the incumbency location

24      to, you know, to level the district in the simulated

25      plan.
```

Page 88

```
1         Q.   And that's true even though the simulated

2    district often does not cover the same geographic

3    area as the enacted district, right?

4         A.   That's possible, certainly.

5         Q.   Okay.  Let's get back if we can, just

6    briefly, to paragraph 23 of your report.

7         A.   Twenty-three, okay.

8         Q.   Which is on page 10 I think.

9         A.   Okay.  Hold on.  Yes.

10        Q.   And I'll just read the last sentence of

11   that paragraph.  It says:  This renaming procedure

12   allows me to compare each enacted district with a

13   comparable simulated district even though the two

14   districts often do not cover the same geographic

15   area.  Is that right?

16        A.   You read it correctly.

17        Q.   All right, thank you.  So for example, in

18   your plan, in your setup plan, your simulated plans,

19   District 1 was the district where Nancy Mace

20   resides; is that correct?

21        A.   Right.

22        Q.   Even if that district covered a different

23   geographic area or some different geographic area

24   than the enacted District 1; is that right?

25        A.   Right, with varying degree.
```

Page 89

1          Q.    Okay.  Thank you.  So let's go back to

2    page 25, paragraph 57 if we can and talk about some

3    of the other constraints that you used.

4          A.    Okay.  Page, hold on.  Okay.

5          Q.    So for -- let's talk about split counties

6    for a second.  I think for the localized District 1

7    and 6 you used a split, a county split avoidance

8    constraint of 0.4; is that right?

9          A.    That's correct.

10         Q.    And would you consider that a moderate

11   strength for that constraint, a heavy strength?  How

12   would you -- help me understand that number a little

13   better.

14         A.    Yeah, again, it doesn't really have a

15   scale so other than the relative scale so, you know,

16   it's hard for me to characterize it that way.

17         Q.    And so as a result of this constraint did

18   your simulation sets generate any plans with more

19   county splits than the enacted plan?

20         A.    So the results of the county splits is in

21   Figure 12.  And so you see that, you know, many of

22   my simulated plans split, you know, have fewer or

23   equal number of county splits as enacted plan.

24   There are a smaller number of maybe about 20 percent

25   of the simulated plan has, you know, slightly more

Page 90

1      county splits than the enacted plan.

2            Q.    Thank you.  I'm glad you sent me to

3      Figure 12 because that was my next question.

4            A.    Oh, okay.

5            Q.    So on the right-hand side on Figure 12

6      there is a histogram for the statewide VRA

7      simulation; is that right?

8            A.    Right.

9            Q.    So I'm having a little trouble reading

10     these numbers but is each of these bars like a

11     single number, like four or five or six or are they

12     a range or?

13           A.    Yeah.

14           Q.    You have the whole number of county splits

15     in the plan, right?

16           A.    Yeah.  It's a whole number even though

17     it's a little bit, slightly shifted to the left.

18           Q.    Okay.

19           A.    Yeah.

20           Q.    What's the minimum number of county splits

21     in a seven district congressional plan with a plus

22     or minus one population deviation?

23           A.    A plus or minus -- I don't -- can you

24     repeat the question again?

25           Q.    Sure.  Yeah.  I'm asking about the -- I'm

Page 91

```
 1        asking you a background question and then I'll ask

 2        you about the histogram.

 3             A.   Oh.

 4             Q.   The enacted plan has seven districts,

 5        right?

 6             A.   Right.

 7             Q.   And in the -- and the Senate factors also

 8        limited the enacted plan to a plus or minus one

 9        person population deviation, right?

10             A.   Right.

11             Q.   So what would you expect to be the minimum

12        number of county splits in a plan under those

13        constraints or under those criteria?

14             A.   If I do a simulation under that condition?

15             Q.   Well, not -- either a simulation or just

16        in the real world.  I mean, before I think you

17        mentioned something about six county splits and it

18        seems to me that if you are drawing seven districts

19        and you've got to get the district to plus or minus

20        one person, then you are going to split six counties

21        to do that, aren't you?

22             A.   I can't really speak to a hypothetical.

23             Q.   Okay.

24             A.   So my analysis is based on, you know,

25        present level data.
```

Page 92

1        Q.    Some of the plans in your statewide VRA

2     simulation generate fewer than six county splits,

3     right?

4        A.    That's correct.

5        Q.    Did you examine how a plan with seven

6     districts can split only four or five counties?

7        A.    Would you clarify what you mean by

8     examine?

9        Q.    Yeah.  Do you have any explanation as to

10    how a plan with seven districts splits only four or

11    five counties?

12       A.    I did not look at this, you know, the

13    plan, simulated plan with this specific number of

14    county splits.

15       Q.    I believe your report says that you were

16    calculating county splits, on average you were

17    counting them so that -- or you programmed them so

18    that on average it doesn't have more than an enacted

19    plan.  And I'm curious what you mean by average,

20    what kind of average are you talking about?

21       A.    Across simulated plans.

22       Q.    Okay.  So --

23       A.    So 10,000 simulated plans.

24       Q.    So if I average the number of county

25    splits across the 10,000 simulated plans, you

Page 93

```
 1      program the algorithm so that that number would be

 2      the same or less than the number of county splits in

 3      the enacted plan; is that right?

 4           A.   Oh, I see.  No.  So what I did was

 5      basically choose the constraint parameter because

 6      that's the input into the algorithm such that, you

 7      know, when you look at the number of county splits

 8      on average, the simulated plans have fewer county

 9      splits than the enacted plan so some simulated plan

10      may have than enacted plans.

11                     So some simulated plans may have more

12      county splits but many other simulated plans would

13      have fewer county splits.  It's not that directly

14      told the algorithm to, you know, make sure an

15      average number of county splits is fewer than

16      enacted, it's more that I choose the parameters of

17      the soft county split constraints in some cases such

18      that the number of county splits is, after looking

19      at the simulated plan, is on average fewer than the

20      enacted plan.

21           Q.   Okay.  So just so I understand, and I

22      appreciate your patience with me since I'm not

23      familiar with your method, okay?  But as I

24      understand it, you are saying that each set of

25      10,000 plans that you have put forward in your
```

Page 94

1     report, each set has on average fewer county splits

2     per plan or as many as the enacted plan, right?

3          A.   Right, that's correct.

4          Q.   So within your set of 10,000 some may have

5     more splits, some may have fewer, right?

6          A.   Yes.  That's exactly right.

7          Q.   And I think Figure 12 shows that and the

8     best way to see that is Districts 1 and 6

9     simulation?

10         A.   Right.

11         Q.   You've got the line for the enacted plan

12    where it is and then you've got --

13         A.   Yeah.

14         Q.   Some plans from your simulation falling on

15    either side of that; is that right?

16         A.   That's right.  So the goal was to put the

17    simulated plans in about the same range or at least

18    about the same range as the enacted plan.

19         Q.   Okay.  And is that also -- in turning how

20    to split municipalities is that also how you

21    calculated the average for split municipalities?

22         A.   Yes, that's correct.  That's Figure 13.

23         Q.   And that's Figure 13 on page 27 of your

24    report, right?

25         A.   Uh-huh.  That's right.

Page 95

1          Q.    So as I understand what happens, you

2     assign a constraint strength and the algorithm

3     generates a universe of plans and then you can go

4     back and pair down that universe to 10,000 plans

5     that enforces kind of your averages for county

6     splits and municipalities and everything else; is

7     that right?

8          A.    Well, so you choose the parameters such

9     that the sample plans, you know, have fewer or equal

10    on average number of splits when compared to the

11    enacted plan.

12         Q.    So while we are talking about splits I

13    have a couple of more questions.

14         A.    Sure.

15         Q.    Do some of your -- did you place --let me

16    back up.

17                    Let's take county splits as an

18    example.  Did you constrain the algorithm to split

19    only the same counties as the enacted plan or can

20    the algorithm draw plans that split different

21    counties than the enacted plan?

22         A.    For statewide simulation it could be a

23    different counties that could be split.  For the

24    second race run simulation, the first one which is

25    the District 1 and 6 simulation, it could also be a

Page 96

1      different counties could be split.

2                      For the second plan simulation where

3      I focus on Charleston County you reach how the

4      Charleston County was split is the focus of the

5      analysis.  And since the rest of the, you know, the

6      districts are kept the same as the enacted plan they

7      would split exactly the same place in county as the

8      enacted plan.  So it depends on which analysis that

9      I've done.

10         Q.   Okay.  And could you have instructed the

11     algorithm to split the same counties as the enacted

12     plan only?

13         A.   Right.  I mean, it's possible to do that.

14         Q.   And is there a reason you didn't do that?

15         A.   So my constraints were guided, you know,

16     in part based on these South Carolina redistricting

17     guidelines and I don't recall that it specified the

18     specific counties that need to be spread in that

19     guideline, although I think there is provision that,

20     you know, said something about dividing the number

21     of county splits.

22         Q.   Now, I'm going to ask you the same

23     questions about the municipality splits.  So do any

24     of your simulated plans with different

25     municipalities than the enacted plan?

Page 97

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 1          A.   Probably.  I did not specify that certain

 2     municipalities should be split.

 3          Q.   Let's move to the next criteria which is

 4     compactness.

 5          A.   Okay.

 6          Q.   We talked a little bit already about

 7     paragraph 57 where there is a default compactness

 8     constraint of one and then there is a localized --

 9     in a localized Charleston County simulation raised

10     to 1.07; is that right?

11          A.   Right, right.

12          Q.   And again, your report says that all the

13     relevant districts are on average at least as

14     compact as the enacted plan?

15          A.   Yeah.

16          Q.   So what was your method for calculating

17     that average?

18          A.   Right.  So this is Figures 10 and 11 so I

19     used two different measures of compactness and, you

20     know, so I specified the constraint and then

21     generate the simulated plans and look at the

22     compactness of districts using these two measures,

23     Polsby-Popper and fractions of edges kept.

24          Q.   How did you choose those measures?

25          A.   So Polsby-Popper is perhaps most commonly
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Page 98

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 1      used measure in this type of analysis and fractions

 2      of edges kept is actually related, closely related

 3      to the -- the compactness that algorithm directly

 4      controls.  So these measures are, you know,

 5      obviously related but they are different.  And

 6      fraction of edges kept is something that algorithm

 7      directly controls or closely related to directly.

 8           Q.    Thank you for that.  Are these

 9      mathematical measures of compactness?

10           A.    Yes, they are.

11           Q.    And again, on the averages, so within your

12      each bucket of 10,000 simulated plans, is it that

13      each bucket on average that districts are as compact

14      as the corresponding district in the enacted plan,

15      is that how you get the average?

16           A.    So here I'm looking at the overall

17      compactness.  So Polsby-Popper is a major for each

18      district, but I'm looking at the average of the

19      districts so that's why there is one number for each

20      limited plan.  It's not like a comparison of the

21      specific district and fraction of edges kept is a

22      plan-wide measure to begin with.  So in both cases

23      I'm looking at the overall compactness, not like

24      each district specific comparison of compactness of

25      those.
```

Page 99

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 1          Q.   So if I can rephrase that, your average is

 2     the average of the plan like compactness?

 3          A.   Correct.

 4          Q.   Not any average of district specific

 5     compactness?

 6          A.   That's correct.

 7          Q.   Okay.  Thank you.  Dr. Imai, can you go

 8     back to tab five in your --

 9          A.   Okay, tab five.  Yes, House guideline.

10          Q.   Yes, that's the House redistricting

11     guidelines?

12          A.   Yes.

13          Q.   And if you will scroll down with me I

14     previously marked this as Exhibit Six.  And on the

15     second page of these guidelines --

16          A.   Uh-huh.

17          Q.   Roman numeral six is titled Compactness.

18     Do you see that?

19          A.   Yes.

20          Q.   The second paragraph under that factor?

21          A.   Uh-huh.

22          Q.   It says:  Compactness should be judged in

23     part by the configuration of prior plans.

24     Compactness should not be judge based on any

25     mathematical, statistical or formula-based
```

Page 100

1          calculation or determination.

2                    Did I read that correctly?

3          A.   You did.

4          Q.   So did you do anything in your model to

5     judge compactness by the configuration of prior

6     plans?

7          A.   Not directly.

8          Q.   How about indirectly?

9          A.   Well, to the extent that I tried to make

10    sure that the overall compactness of my simulated

11    plans is comparable to the enacted plan.  So to the

12    extent that the enacted plan does take this

13    consideration into account, you know, they are

14    related, but not directly.  I didn't directly

15    compare to the prior plans.

16         Q.   And when you were -- to the extent that

17    you were indirectly comparing, that was based on the

18    mathematical measures, correct?

19         A.   Yes, everything I do is mathematical.

20         Q.   So it wasn't based on the shape of the

21    district, for example, correct?

22         A.   No.  Shape in the mathematical sense.

23         Q.   Fair enough.  Very well said.  And here

24    the House says that compactness should not be judged

25    based upon any mathematical calculation or

Page 101

```
 1      determination, correct?

 2           A.   That's -- you read it correctly.

 3           Q.   And Dr. Imai, if you would be so kind as

 4      to turn back to tab six with me which I previously

 5      marked as Exhibit Seven.

 6           A.   Senate Guidelines.

 7           Q.   And this is the Senate Guidelines.

 8           A.   Okay.

 9           Q.   And if you will go with me to page 2.

10           A.   Okay.

11           Q.   Roman numeral three is additional

12      considerations?

13           A.   Uh-huh.

14           Q.   And F is district compactness?

15           A.   Okay.

16           Q.   And it reads:  In determining the relative

17      compactness of the district consideration should be

18      given to geography, demography, communities of

19      interest and the extent to which parts of the

20      district are joined by roads, media outlets or other

21      means for constituents to communicate effectively

22      with each other and with their representative.

23                     Did I read that correctly?

24           A.   You did.

25           Q.   And does the algorithm account for
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Kosuke Imai, PhD                                    August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 102

```
 1        geography, demography, communities of interest or

 2        the extent to which parts of the district are joined

 3        by roads, media outlets or other means for

 4        constituents to communicate effectively with each

 5        other?

 6             A.   So it depends on what we mean by

 7        geography, demography, community.  So interest,

 8        because obviously the algorithm is using the state

 9        geography, it operates on the shape files and it

10        uses population data to determine the size,

11        population size of the district.

12                      And in the statewide case, you know,

13        analysis I take into account for the racial data.

14        In terms of communities of interest, you know, I

15        take into account the administrative boundaries like

16        counties and municipalities.  And so to the extent

17        that those inputs I used are related to this type of

18        consideration they are taken into account but, you

19        know, the algorithm doesn't do anything more than

20        that.

21             Q.   And the Senate guidelines also don't

22        mention use of a mathematical measure of

23        compactness, correct?

24             A.   Yes, I don't see that mentioned.

25             Q.   Let's scroll up here, same page,
```

Page 103

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 1     additional considerations on the Senate guidelines,

 2     letter B is constituent consistency and it lists:

 3     Preserving the cores of existing districts.

 4                    Did the algorithm consider preserving

 5     the cores of existing districts in generating plans?

 6          A.   So to the extent that, you know, I

 7     instructed the algorithm to avoid incumbents pairing

 8     and to the extent that my race plan simulations, for

 9     example, freezes, you know, all the districts other

10     than Districts 1 and 6 and in the case of second

11     race-blind simulation it freezes everything other

12     than Charleston County.

13                    So in that sense, you know, there are

14     constraints that have implications of cores of

15     existing districts, preservation.

16          Q.   Did you --

17          A.   But the analysis I presented in my final

18     report did not directly use, you know, previous --

19     the benchmark plan.

20          Q.   And so your analysis did not include a

21     constraint for preserving the cores of districts,

22     correct?

23          A.   Not directly.

24          Q.   And likewise, it did not include a

25     constraint for keeping incumbents' residences in
```

Kosuke Imai, PhD                                         August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 104

1     districts with their core constituents, correct?

2          A.   Yeah, incumbents weren't paired but there

3     was no constraint that directly, you know, that

4     needs a definition of what the core constituency of

5     incumbents are.  And that information was not

6     available so I did not include that either.

7          Q.   And as we discussed before, the districts

8     in your simulation plans had the same numbers as

9     districts in the enacted plan but may cover

10    different geography; is that right?

11         A.   That's correct, depending on, you know,

12    this will change across analysis and, you know, I

13    have three analyses.  So first two analyses are

14    probably much bigger overlap than statewide

15    analysis, for example, but yeah.

16         Q.   So for example, wouldn't that also mean

17    that because the districts encompass different

18    geography they encompass different populations and

19    voters, correct?

20         A.   That's correct, different people in

21    different areas.

22         Q.   And speaking with this page, communities

23    of interest --

24         A.   Uh-huh.

25         Q.   Did you include any constraint for

Page 105

1      communities of interest?

2          A.    So again, only to the extent that, you

3      know, things like administrative boundaries, like

4      counties and municipalities overlap with these

5      interest and to the extent that, you know, incumbent

6      residence wasn't paired, but there is no definition

7      of communities of interest available so I didn't use

8      that.

9          Q.    So there was no direct constraint on

10     communities of interest, correct?

11         A.    That's correct to the extent that --

12         Q.    Okay.

13         A.    Yeah, I don't have, you know, definitions

14     of what these communities are.

15         Q.    And so you didn't assign a strength to

16     communities of interest, correct?

17         A.    Right, because there is no mathematical,

18     you know, geographical definition of communities of

19     interest so I didn't assign that constraint directly

20     to this.

21         Q.    And so you also didn't assign a strength

22     to preserving the course of existing districts,

23     correct?

24         A.    That's correct.  For the reason that I

25     explained that in order to isolate the role that

Page 106

```
 1      race played in determining the districts of enacted

 2      plan that I didn't want to include any plan

 3      including the benchmark plan.

 4           Q.   And similarly, you didn't assign a

 5      strength to keeping incumbents residences in

 6      districts with their core constituents, correct?

 7           A.   Right.  So the weights are for just the

 8      avoidance of incumbent pairing and not with respect

 9      to their core constituents because they are not --

10      that definition was not available to me.

11           Q.   Okay.  Let's look down at letter E,

12      minimizing divisions of voting precinct boundaries?

13           A.   Uh-huh.

14           Q.   Did you program a constraint in the

15      algorithm for VTD splits or precinct splits?

16           A.   Let's me double check.  Yeah, I don't

17      think so.  It's no a listed in paragraph 57, which

18      is not -- yeah.

19           Q.   And I don't believe it's listed in

20      paragraphs 20 or 22 either.

21           A.   Yeah, I wanted to double check, yeah.  I

22      don't think I imposed that constraint.

23           Q.   So let's go to -- can we go to figure 14

24      on page 27 of your report?

25           A.   Yes.
```

Page 107

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 1           Q.    Wonderful.  Thank you.  So you do include

 2      here some histograms of VTD splits?

 3           A.    Uh-huh.

 4           Q.    Is that what I'm seeing in figure 14?

 5           A.    Yes.

 6           Q.    And it looks like the enacted plan

 7      performs better than most of the District 1 and six

 8      simulation plans on VTD splits; is that right?

 9           A.    That's correct.

10           Q.    And the enacted plan appears to perform

11      better than all the Charleston County simulation

12      plans or at least the vast majority of them on VTD

13      splits too, right?

14           A.    Yes, that's correct.

15           Q.    And I add that caveat because I can't tell

16      based on this histogram whether there is --

17      Charleston County seems to be left to that line,

18      right?

19           A.    Yeah, sure.

20           Q.    And then in terms of state wide VRA

21      simulation the enacted plan again outperforms the

22      vast majority of the plan from the statewide VRA

23      simulations; is that right?

24           A.    That's correct.

25           Q.    And down here in paragraph F, the second
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Page 108

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1      paragraph or I'm sorry the second sentence there in

2      paragraph 61 under the heading F still on page 27?

3           A.   Yeah, I see that.

4           Q.   You say:  This is in part due to the fact

5      that many municipalities split VTDs implying that

6      there often is a direct tradeoff between

7      municipality and precinct splits.

8           A.   Uh-huh.

9           Q.   Did I read that correctly?

10          A.   Yes, you did.

11          Q.   Can you explain what you mean by tradeoff

12     between municipalities -- I'm sorry, municipality

13     and precinct splits?

14          A.   Yeah, so basically the precincts are not

15     nested, in the case of South Carolina, are not

16     necessarily nested in municipalities.  So

17     municipalities may split the VTD so if you want to

18     reduce the number of municipality splits that may

19     mean that you end up -- because a municipality cut

20     to the precinct you may end up splitting the VTDs,

21     the precincts.

22          Q.   I've got it.  So minimizing municipalities

23     splits means that sometimes VTDs will be split; is

24     that right?

25          A.   That's right.
```

Page 109

```
 1              Q.    Okay.

 2              A.    So if you are trying to keep the

 3      municipalities together you may end up splitting the

 4      VTDs whether as if you try to keep the VTDs together

 5      you may end up splitting municipalities.

 6              Q.    And the other thing I want to ask you

 7      about this sentence is you use VTDs in precinct?

 8              A.    Oh.

 9              Q.    Are you -- are you using those terms

10      interchangeably?

11              A.    Yes, yes, interchangeably.

12              Q.    All right.  I'd like to go back to

13      paragraphs 20 and 22 back on page seven?

14              A.    Okay, hold on.

15              Q.    I guess.  I'm sorry, I think maybe

16      page eight.

17              A.    Page 8, okay.

18              Q.    In paragraph 20 it says:  No race or

19      partisan information was used and in paragraph 22

20      which is talking about your VRA set is says:  No

21      partisan information was used.  So just to confirm,

22      you didn't use partisan information in any of your

23      simulations, correct?

24              A.    No.

25              Q.    So you didn't consider election data; is
```

Kosuke Imai, PhD                                      August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 110

 1      that right?

 2           A.   Yeah, I didn't use it.

 3           Q.   And you didn't consider whether the

 4      district would enact -- would elect a Republican or

 5      a Democrat, right?

 6           A.   No, yeah.

 7           Q.   And you didn't --

 8           A.   That's right.

 9           Q.   And you didn't consider voter registration

10      by party, correct?

11           A.   No, yeah, I didn't consider that.

12           Q.   Now, could you have instructed the

13      algorithm to consider politics or added a politics

14      constraint to the algorithm?

15           A.    If the politics is, you know, what we mean

16      by partisan mathematically formulated, yes.

17           Q.    All right.  So for example, could you have

18      added a constraint to the algorithm that required

19      that six of the seven districts elect a Republican

20      rather than a Democrat?

21           A.    Right, yeah, I could have done that.

22           Q.    And could you have instructed the

23      algorithm to require that District 1 have a higher

24      percentage of the Trump vote share in 2020 than the

25      benchmark District 1?

Page 111

```
 1          A.    That's definitely possible as long as it's

 2     specified, you know, in a mathematical, operational

 3     way.

 4          Q.    And if you use some kind of constraint

 5     like this in partisan gerrymandering cases, right?

 6          A.    I -- I don't think so although, you know,

 7     it's -- I'm using my memory because in partisan

 8     gerrymandering case often is to see if you use a

 9     simulation without partisan information and then

10     compare that nonpartisan baseline with enacted plan

11     and look at the partisan, you know, how different

12     they are with the partisan simulation.  So in the

13     simulation often you don't include the partisan

14     information because you want to establish a

15     nonpartisan baseline.

16          Q.    I've got it, okay.  Thank you for that

17     clarification.

18          A.    Uh-huh.

19          Q.    But for these -- for this report at least

20     you didn't include any kind of constraint like that,

21     correct?

22          A.    Right, for this report I did not use any

23     partisan information.

24          Q.    And why didn't you do that?

25          A.    Because it was not clear from the
```

Page 112

1     guideline how the partisan information should be

2     incorporated, at least to me, so -- and I wasn't

3     also instructed to do so either.

4          Q.    Dr. Imai, do you have a view as to whether

5     race and politics are highly correlated in South

6     Carolina?

7          A.    I have not analyzed that particular aspect

8     so I don't have, you know, I don't have opinion on

9     that particular question.

10         Q.    And do you have an opinion on whether race

11    rather than politics explains the enacted plan?

12         A.    My analysis does not address that question

13    so I have no opinion on that.

14         Q.    All right.  So now I can ask you some more

15    questions about each of the simulations you

16    conducted if that would be okay?

17         A.    Sure.

18         Q.    So we are still in your report and your

19    first simulations, your localized simulations do not

20    include a VRA constraint; is that right?

21         A.    That's correct.  It's race neutral.

22         Q.    And why don't they include a VRA

23    constraint?

24         A.    Oh, because, you know, in order to assess

25    whether race played any role in drawing the

Page 113

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 1      boundaries of the enacted plan what you want to do

 2      as a first step is to, you know, create -- conduct a

 3      simulation analysis to have a race neutral baseline

 4      and then by comparing the race neutral baseline with

 5      the enacted plan you can see how race played a role

 6      in drawing boundaries, in this case between

 7      Districts 1 and 6 under the enacted plan.

 8           Q.   And in the statewide simulation you did

 9      include the VRA constraint, correct?

10           A.   That's correct.

11           Q.   And what -- I'm sorry, go ahead.

12           A.   Yeah, that's correct.

13           Q.   Okay.  And is there a reason you didn't

14      run a statewide simulation without the VRA

15      constraint?

16           A.   Oh, I see.  The reason is that statewide

17      simulation was there to address the possibility that

18      you know, what I found in the race neutral

19      simulation analysis is due to the VRA consideration.

20      And that was the purpose of the statewide simulation

21      analysis and so for that analysis I included the VRA

22      constraint.

23           Q.   Dr. Imai, let's go to -- let's talk first

24      about your District 1 and District 6 localized

25      simulation, if that's okay?
```

Page 114

```
 1          A.    Sure.

 2          Q.    I'd like to start at page 11.

 3          A.    Okay.

 4          Q.    So as I understand the simulation you only

 5     altered the boundary between District 1 and 6,

 6     right?

 7          A.    That's correct.

 8          Q.    So the boundaries of Districts 2, 5 -- 2,

 9     3, 4, 5 and 7 are all unchanged in this simulation?

10          A.    Right, fixed under the enacted plan.

11          Q.    Great.  All right.  So paragraph 27 and

12     then you have a Figure 1 on page 12 --

13          A.    Uh-huh.

14          Q.    That shows precincts or VTDs by BVAP; is

15     that right?

16          A.    Right, that's correct.

17          Q.    And you are using the total black voting

18     age population by number rather than a black voting

19     age population percentage, right?

20          A.    That's correct.

21          Q.    And so the black voting age population

22     percentage in two districts with the same total

23     black voting age population could be different,

24     right?

25          A.    Oh, yeah, that's true.
```

Page 115

1          Q.   And so moving either of those precincts in

2     or out of the district could have a different net

3     effect on the district's BVAP percentage, correct?

4          A.   I'm not sure I understand the question.

5          Q.   Sure.  So let's -- let's spin this out.  I

6     think you agree with me there are two precincts --

7     let's take two precincts, each of which have 500

8     individuals -- black individuals of voting age

9     population.

10         A.   Uh-huh.

11         Q.   One of those precincts -- let's say it

12    only has 500 people in it so it's 100 percent BVAP

13    precinct?

14         A.   I see.

15         Q.   The other precinct has a thousand people

16    in it so it's a 50 percent BVAP precinct.

17         A.   I see, I see.

18         Q.   And moving those in between districts will

19    have different effects on the districts' BVAP

20    population, right?

21         A.   Moving meaning -- what do you mean by

22    moving?

23         Q.   Well, either moving it in or out of the

24    district.

25         A.   Oh, I see.

Page 116

```
 1           Q.   So if I have 100 percent BVAP precinct to

 2      a district that has a different effect on a district

 3      than if I have 50 percent BVAP?

 4           A.   Yeah.

 5           Q.   Okay.

 6           A.   So yeah, so the number -- BVAP population

 7      is the same but the proportion would be different,

 8      different depending on the total number of -- total

 9      population in that precinct, that's correct.

10           Q.   Now, if I'm reading this correctly,

11      Figure 1, on the right-hand side there -- you also

12      have the -- this cool colored chart that shows how

13      often the VTD was placed in District 1; is that

14      right?

15           A.   Uh-huh, right.

16           Q.   And the darker numbers show that the VTD

17      was more frequently placed in District 1?

18           A.   That's right.

19           Q.   In the lighter color, right?

20           A.   That's correct.

21           Q.   And so do you know as you sit here right

22      now where Nancy Mace, the District 1 incumbent,

23      lives?

24           A.   Yes, I think near the border, right, the

25      precinct border, the district border, if I remember
```

Page 117

```
 1      correctly.
 2           Q.   Yeah, I think she lives in Berkeley County
 3      if I'm not mistaken, but I don't know that for sure,
 4      but I'm pretty sure that's right.  So of course,
 5      whatever precinct she lives in ends up in District 1
 6      100 percent of the time?
 7           A.   That's right.
 8           Q.   Okay.
 9           A.   That's correct, yeah.
10           Q.   All right.  It looks like large parts of
11      Charleston -- the city of Charleston and Charleston
12      County end up at in District 1 very frequently, at
13      least 90 percent of the time or more; is that right?
14           A.   That's my finding.
15           Q.   Okay.  So in your simulated plans, Nancy
16      Mace is frequently placed in a district with the
17      City of Charleston or large portions of Charleston
18      County; is that right?
19           A.   That I think is consistent with my
20      finding.
21           Q.   Are you aware of any reason why the map
22      drawer may not have wanted to include Nancy Mace in
23      a district with the city of Charleston or a big
24      portion of Charleston County?
25           A.   No, I don't consider a map drawer's
```

Kosuke Imai, PhD                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 118

```
 1      intent.
 2           Q.   Did you consider the political effect on
 3      Nancy Mace's reelection chances --
 4           A.   No.
 5           Q.   Of Nancy Mace being placed with City of
 6      Charleston?
 7           A.   No.
 8           Q.   Or with a large portion of Charleston
 9      County?
10           A.   No political information is used for my
11      analysis.
12           Q.   Okay.  So in this analysis shown in
13      Figure 1 --
14           A.   Uh-huh.
15           Q.   Does your analysis control at all for the
16      benchmark district the VTD was in under the
17      benchmark plan?
18           A.   No, I don't use the benchmark plan for my
19      analysis.
20           Q.   And does it control for where the black
21      voters and black individuals on this map live?
22           A.   No, this is race-blind simulation so no
23      racial information is used either.
24           Q.   And in terms of the -- so we've talked
25      about this, this was Districts 1 and 6; is that
```

Kosuke Imai, PhD                                        August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 119

```
 1      correct?

 2           A.    That's correct.

 3           Q.    And I think on paragraph 29 you mentioned

 4      that the average difference in the BVAP proportion

 5      of District 1 between the enacted and race-blind

 6      simulated plans is about 5.8 percentage points; is

 7      that right?

 8           A.    Right, the difference, yes, average

 9      difference.

10           Q.    And where is that 5.8 percentage point

11      average coming -- where are those black voters

12      coming from in your simulated plans?

13           A.    Oh, I suspect they are coming from the

14      City of Charleston.

15           Q.    Okay.  And so in your simulated plans --

16           A.    And then maybe the City of North

17      Charleston as well.

18           Q.    So your simulated plans have 5.8

19      percentage points BVAP higher in District 1 --

20           A.    Right.

21           Q.    But they have a lower BVAP in some other

22      district or districts as a result, correct?

23           A.    Right.  In this case, there is only two

24      districts being analyzed so District 6 would be the

25      one that's lower in terms of BVAP proportion under
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Page 120

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 1     the simulated plan compared to the enacted plan.

 2          Q.    So the 5.8 percentage points would mean

 3     that District 6's BVAP has dropped to something like

 4     41.1 percent; is that right?

 5          A.    Yeah, it won't be exact because the

 6     population difference is there, but yeah, I think

 7     there is, you know, decrease in BVAP proportion of

 8     District 6 under the simulated plan when you compare

 9     that with enacted plan.

10          Q.    So let me turn to the histogram on page 13

11     which is your Figure 2.

12          A.    Page 13 -- oh, Figure 2, yes.

13          Q.    So Figure 2 shows that some of the

14     simulated plans have a District 1 BVAP proportion of

15     up to 28 percent or maybe even 30 percent; is that

16     right?

17          A.    Yeah, close to 30 maybe.

18          Q.    30 percent, close to 30 would be about 12

19     to 13 percent higher in District 1 than in the

20     enacted plan, right?

21          A.    I don't recall exact -- yeah, no, that's

22     right.

23          Q.    Well, it's higher?

24          A.    Yeah, I see the line.  Yeah, I don't know

25     the exact number but, yes.
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Page 121

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 1          Q.   Yeah, I think in paragraph 29 it says

 2     17.4 percent.

 3          A.   Okay.

 4          Q.   Okay.  So if we have a plan in the

 5     simulation --

 6          A.   Yeah.

 7          Q.   At 29.4 percent that's 12 percent higher,

 8     right?

 9          A.   That's right.

10          Q.   And that would mean that District 6's BVAP

11     is 12 percent lower, right?

12          A.   Right.

13          Q.   But you didn't provide a histogram showing

14     how enacted District 6's BVAP compares to the BVAP

15     in your simulated plan, correct?

16          A.   Right, because it would be, you know, a

17     mirror image because I'm just working with two

18     districts.

19          Q.   So enacted District 6 has a higher BVAP on

20     average than your simulated District 6s would have,

21     correct?

22          A.   For District 6, yeah.

23          Q.   And in fact, it would be on average

24     5.8 percent or so higher --

25          A.   Right.
```

Page 122

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 1           Q.    Once you account for population variation?

 2           A.    Yeah, in that range, that's correct.

 3           Q.    So in this simulation, black voters are

 4    just being moved between District 6 and District 1,

 5    correct?

 6           A.    Well, not just black voters but because

 7    I'm just doing the simulation between Districts 1

 8    and 6 so that, you know, the voters are assigned to

 9    one of the two districts.

10           Q.    And did you analyze the effect in

11    District 6 of decreasing the BVAP, did you analyze

12    the effect of that on black voters' ability to elect

13    their candidates of choice?

14           A.    Oh, I didn't use any partisan analysis in

15    my report so no.

16           Q.    Now, you didn't do a similar local

17    simulation for Districts 2 and 6, correct?

18           A.    Two and six, no.

19           Q.    Why not?

20           A.    Well, I started with the one and six

21    because that boundary is the largest change that

22    happened in the enacted plan when they -- you know,

23    compared to the benchmark plan.

24           Q.    And have you done any similar local

25    simulation for Districts 2 and 6?
```

Page 123

1          A.    I don't think so.

2          Q.    How about for Districts 5 and 6?

3          A.    I don't think so.

4          Q.    And why not for Districts 5 and 6?

5          A.    Like I said, the largest change happened

6     in district boundary in between one and six so it

7     was natural for me to focus on that.

8          Q.    So we were talking a minute ago about how

9     the change in District 6's BVAP is the mirror image

10     of the change in District 1's BVAP?

11          A.    In this analysis?

12          Q.    In this analysis, correct.

13          A.    Right.

14          Q.    Okay.  So under your definition this

15     analysis cracks black voters out of District 6,

16     correct?

17          A.    Well, it depends on which black voters you

18     are looking at.  If you look at black voters in, you

19     know, Charleston, the City of Charleston, then the

20     enacted plan cracks it because they divided these

21     voters into Districts 1 and 6 and that's basically

22     my finding for that analysis.

23          Q.    In terms of -- I believe you said your

24     definition of cracking is voters being split --

25     black voters living in a certain area are split into

Page 124

1      separate districts; is that right?

2           A.    That's right.

3           Q.    So in your simulation plans black voters

4      living in certain areas are split between Districts

5      6 and 1, correct?

6           A.    Well, you -- if you give me a definition

7      of group of black voters who live in a certain

8      location I might be able to answer that question,

9      but without that definition it's...

10          Q.    Okay.  Well, take Charleston for example.

11          A.    Uh-huh.

12          Q.    You said the enacted plan cracks voters in

13     the City of Charleston but doesn't -- don't your

14     simulation plans do the same thing?

15          A.    I think more often the City of Charleston

16     as a whole is included in the same district under my

17     simulated plan.

18          Q.    But some simulated plans split the City of

19     Charleston.

20          A.    Oh, yeah, of course.  It's all statistical

21     so it's a question of how frequently that occurs.

22          Q.    And so those plans crack black voters,

23     correct?

24          A.    Well, I don't know whether there is such

25     simulated plans and it could exist and if they do,

Page 125

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1      they do but I don't know whether any of my simulated

2      plans have such, you know, specific split that you

3      describe.

4           Q.   But if the simulated plans do have that

5      split then they crack black voters, right?

6           A.   That particular plan does.

7           Q.   And similarly, if a simulated plan cracks

8      or splits North Charleston, for example, would that

9      also be cracking under your definition?

10          A.   If there is such a simulated plan then it

11     is but we need to look at the distribution of

12     simulated plans, not particular specific ones.

13     That's sort of the whole point of statistical

14     analysis is to look at the distribution as opposed

15     to specific simulated plans.

16          Q.   Right, but just conceptually speaking, a

17     simulated plan that splits a black community in a

18     defined location whether it's City of Charleston,

19     North Charleston or somewhere else --

20          A.   Uh-huh.

21          Q.   Cracks that black community under your

22     definition, right?

23          A.   Right, but the -- the use of the term,

24     cracked, does not have any legal meaning.  It just

25     means that the group of voters who living in a
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Page 126

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 1     certain geographical area are separated into two

 2     districts.  So I just wanted to make sure that

 3     that's clear.

 4          Q.   Thank you.  Yeah, I think you said that

 5     before.

 6          A.   Okay, okay.

 7          Q.   But thank you, I appreciate that.

 8          A.   All right.

 9          Q.   And there was not -- I didn't see anything

10     in this section of your report discussing whether

11     the simulated plans or how frequently the simulated

12     plans split the City of Charleston.  Is that in

13     here?

14          A.   I don't think so.  Yeah, I don't think so.

15          Q.   And similarly, it also doesn't include

16     that kind of statistic or statement for North

17     Charleston either I don't think; is that right?

18          A.   Yeah, I don't think so.

19          Q.   All right.  Now, let's turn to your --

20               MR. GORE:  Actually, go let's go off the

21     record for just a moment.

22               THE WITNESS:  Okay.

23                    (A recess was taken.)

24     BY MR. GORE:

25          Q.   All right.  Let's talk about your
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Page 127

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 1     Charleston County simulation.

 2          A.    Okay.

 3          Q.    Which starts on page 13.  And as I

 4     understand it, this is similar to the first

 5     simulation except with the further constraint that

 6     the boundaries of Districts 1 and 6 are the same

 7     except in Charleston County; is that right?

 8          A.    That's right.

 9          Q.    So you've frozen the enacted plan and all

10     you are looking at is the boundary between

11     Districts 1 and 6 in Charleston County; is that

12     correct?

13          A.    That's correct.

14          Q.    And let's see.  So pages 14 and 15 you

15     again have a couple of histograms here.

16          A.    Right.

17          Q.    That show Charleston County BVAP in

18     Figure 3; is that right?

19          A.    Uh-huh.

20          Q.    And again, the analysis here is total

21     number of black voters rather than BVAP percentage;

22     is that right?

23          A.    Right, although in Figure 2 it's

24     percentage.

25          Q.    Right.  And Figure 2 is a percentage for
```

Kosuke Imai, PhD                              August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 128

1      District 1, correct?

2            A.   Right, and here it's the BVAP in

3      population who live in Charleston County.

4            Q.   All right.  So help me understand that

5      because I had an understanding of figure four, so is

6      figure four showing me something about Charleston

7      County or district one as a whole?

8            A.   Oh, this is among the black voters who

9      live in Charleston County how many of them are

10     assigned to District 1.

11           Q.   Okay.  I think I just confused us both.

12     Are you talking about Figure 3 or Figure 4?

13           A.   Figure 3.

14           Q.   Figure 3, okay.  Thank you.  Okay.  So

15     Figure 3 is just Charleston County and it's BVAP

16     total, not BVAP percentage, right?

17           A.   Right, that's right.

18           Q.   And again, in this simulation you didn't

19     control for which benchmark district a voter was in,

20     in the benchmark plan, correct?

21           A.   No.

22           Q.   And you also didn't control for which

23     district the black voters lived in, in the benchmark

24     plan, correct?

25           A.   No, I didn't use benchmark plan.

Page 129

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 1         Q.   And I believe in paragraph 32 you said the

 2    difference on average, that District 1 has

 3    approximately 24,900 black voters on average in your

 4    simulation plans and that that's a difference of

 5    9500 voters compared to the enacted plan; is that

 6    right?

 7         A.   Yeah, that's correct.

 8         Q.   And 9500 voters, do you know what that

 9    translates into in terms of District 1's BVAP

10    percentage?

11         A.   Oh, you just have to divide by the

12    population.

13         Q.   By the population, okay.  So if I told you

14    that I tried to do this math last night and I think

15    it's 1.3 percent, does that sound about right to

16    you?

17         A.   Yes, I suppose.  Yeah, it's more than

18    1 percent.  Yeah, that sounds right.  I trust you.

19         Q.   Okay.  Well, that's fine.  We'll -- you

20    can take my word for it, you don't have to agree

21    with me, but you have no reason to dispute that it

22    might be 1.3 percent?

23         A.   Right.

24         Q.   1.29 or whatever it rounds off to?

25         A.   Sure.
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Page 130

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1          Q.   And so that would mean that under the

2     simulation plans the BVAP in District 1 is

3     1.3 percent higher on average but in District 6 it's

4     1.3 percent lower on average; is that right?

5          A.   Right, in the simulation analysis, that's

6     correct, yeah.

7          Q.   And have you done any effect of this

8     analysis on this 1.3 percent change in these two

9     districts' BVAP?

10         A.   No, I have not done any partisan analysis.

11         Q.   All right.  Let's go to page 26 in your

12     report.

13         A.   Twenty-six, okay.

14         Q.   I'd like to look at Figure 10.

15         A.   Okay.  Figure 10.  Okay.

16         Q.   As I understand it, Figure 10 shows the

17     Polsby-Popper compactness scores for the various

18     simulations and the enacted plan; is that right?

19         A.   Right, that's correct.

20         Q.   And on Polsby-Popper metric a higher

21     number means more compact, correct?

22         A.   That's correct, yeah.

23         Q.   So I want to look at the Charleston County

24     simulation table you have here in Figure 10 or a

25     histogram rather than a table.
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Page 131

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 1          A.    Yeah.

 2          Q.    So you froze all of the other district

 3     boundaries in the enacted plan except for Charleston

 4     County between one and six?

 5          A.    Uh-huh.

 6          Q.    It appears here that the enacted plan

 7     performs better on average than the vast majority of

 8     plans under the Charleston County simulation on the

 9     Polsby-Popper; is that right?

10          A.    I wouldn't characterize it that way.  It

11     would be, it was in, you know, within statistical

12     differences.  It's not significantly different.

13          Q.    But the --

14          A.    They are essentially in the same range.

15          Q.    Okay.  But the majority of the simulated

16     plans on average are to the left of that line,

17     right?

18          A.    It looks like it but, again, I would not

19     take that difference, you know, to be statistically

20     meaningful and I would characterize it as they are

21     basic -- essentially in the same range.

22          Q.    And do you have any view on what accounts

23     for that difference?

24          A.    Can you clarify the question?

25          Q.    Well, I'm just curious, it's more for my
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Page 132

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 1      academic interest.

 2           A.   Uh-huh.

 3           Q.   You know, if there is something about the

 4      model that would explain this difference as to why

 5      the simulation --

 6           A.   Oh, I see.

 7           Q.   I mean, on average -- given the other

 8      constraints that you programmed and other things

 9      that you did.

10           A.   Yeah, I mean, compactness, you know, there

11      are different measures and each measure reflects

12      different aspects of geographical shape of districts

13      and, you know, the algorithm controls the fraction

14      of edges kept which is the one in Figure 11 so that

15      is the one that sort of much more closely related to

16      what algorithm does, just a mathematical

17      formulation.

18                     And so Polsby-Popper is related to

19      that but not the same thing so, you know, I would

20      characterize the results on the Polsby-Popper to be

21      essentially in the same range, simulated plan and

22      enacted plan essentially the same.  For the fraction

23      of edges kept simulated plans is maybe a little bit

24      better but it's not that, you know, huge difference.

25      That would be my characterization.
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Page 133

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 1            Q.   Okay.  And just so I'm clear, this

 2      histogram in Figure 10, the Charleston County

 3      simulation average Polsby-Popper score, is that

 4      showing the averages for Districts 1 and 6 or is

 5      that showing the average for the whole plan?

 6            A.   For Districts 1 and 6.

 7            Q.   Okay, thank you.

 8            A.   Oh, wait.  Actually, I don't recall so...

 9            Q.   Okay.

10            A.   So either way, the other districts are

11      frozen so it won't affect the difference --

12            Q.   Right, okay.

13            A.   Between the two, yeah.

14            Q.   Yeah, so in relative terms it would be the

15      same, right?

16            A.   Yeah, yeah, that's right.  And that's what

17      matters is that, you know, the differences as

18      opposed to the number itself.

19            Q.    Other than Charleston County, are you

20      aware of any other counties that are split between

21      Districts 1 and 6 in the enacted plan?

22            A.    Yeah, I think I analyzed Richland and

23      Sumter in the statewide analysis.

24            Q.    Are those counties split between

25      Districts 1 and 6?
```

Page 134

1          A.    Oh, one and six, I'm sorry.  I thought any

2     county that's split by District 6.  So I -- yeah, I

3     misunderstood your question.

4          Q.    Would you like me to rephrase it again?

5          A.    Yeah, yeah, yeah.

6          Q.    Yeah.  So other than Charleston County are

7     you aware of any other counties that are split

8     between District 1 and District 6 in the enacted

9     plan?

10          A.    Yeah, I know there are others.  I don't

11     recall exactly which one but...

12          Q.    And did you conduct a similar local

13     simulation analysis of any of those counties?

14          A.    Oh, no.

15          Q.    So you didn't do one for Dorchester

16     County; is that correct?

17          A.    No, I didn't do that.

18          Q.    Or Colleton County?

19          A.    No.

20          Q.    Or Jasper County?

21          A.    No.

22               MR. GORE:  So let's go off the record

23     again.

24                    (A recess was taken.)

25     BY MR. GORE:

Page 135

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1              Q.   Dr. Imai, did you discuss your deposition

2        with anyone on the break?

3              A.   No.

4              Q.   All right.  Let's move to your statewide

5        simulation analysis with the VRA constraint.

6              A.   Okay.

7              Q.   And in the statewide simulation unlike the

8        local simulations you don't freeze any districts,

9        correct?

10             A.   That's correct.

11             Q.   And you add the additional criterion of

12       your VRA constraint, correct?

13             A.   Uh-huh, that's correct.

14             Q.   And that criterion was to keep the overall

15       BVAP proportion of District 6 between 45 percent and

16       50 percent, correct?

17             A.   That's right.

18             Q.   And in your simulation that district would

19       have been Congressman Clyburn's district since he is

20       the representative of District 6 in the enacted

21       plan, right?

22             A.   That's right.

23             Q.   And why did you add this criterion or

24       constraint?

25             A.   Oh, because in the statewide simulation as
```

Page 136

1      we discussed the district boundary that's been

2      simulated is just between Districts 1 and 6 so as we

3      discussed, you know, the increase in BVAP in

4      District 1 would decrease the BVAP proportion of

5      District 6 because there is only two districts

6      that's being considered in the analysis.

7                      So I wanted to make sure that when,

8      you know, when this BVAP for District 6 is at the

9      certain level in enacted plan if that consideration

10     was incorporated in that simulation analysis my

11     results are still robust to that change.

12                     So by considering other districts it

13     allows me to keep the BVAP proportion of District 6

14     at the same level, you know, in comparison to the

15     two district analysis where increasing the BVAP in

16     District 1 would automatically just by construction

17     decreases the BVAP proportion of District 6.

18          Q.   And are you aware of whether the General

19     Assembly had a goal to keep District 6's BVAP

20     between 45 percent and 50 percent?

21          A.   No, I don't take into account for any

22     intent of General Assembly in my analysis.

23          Q.   And did -- was this 45 percent to

24     50 percent District 6 BVAP constraint anywhere in

25     the House or Senate Redistricting Guidelines?

Page 137

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 1          A.   Not this specific number, no.

 2          Q.   Okay.  How did you select this specific

 3     number?

 4          A.   Oh, just the same range as the one in the

 5     enacted plan, which I think is 46-point some percent

 6     so.

 7          Q.   So you chose this range because it

 8     approximately straddles the actual BVAP percentage

 9     in enacted District 6?

10          A.   That's correct, yeah.

11          Q.   And do you believe that a district drawn

12     between 45 and 50 percent BVAP complies with the

13     Voting Rights Act?

14          A.   I'm not a lawyer so I can't -- I don't

15     have, you know, legal opinion on that.

16          Q.   Do you have a nonlegal opinion on that?

17               MR. CEPEDA:  Object to form.

18     BY MR. GORE:

19          Q.   Do you have any opinion on that?

20          A.   The question is legal so I have no opinion

21     on that legal question.

22          Q.   I followed up with nonlegal, but then I

23     said, do you have any opinion on that one way or the

24     other?

25          A.   Well, if the question is legal I don't
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Page 138

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 1      have any opinion on that.

 2            Q.   All right.  Let's go back to page 26 of

 3      your report, paragraph 57.

 4            A.   Okay.  Wait, can you say page number

 5      again?

 6            Q.   I'm sorry, page 25.

 7            A.   Oh, 25.

 8            Q.   Page 25, paragraph 57.

 9            A.   Twenty-five, 57, okay.  All right.  Okay.

10            Q.   Okay.  So we are back to the strength of

11      the constraint?

12            A.   Uh-huh.

13            Q.   And then the statewide VRA simulation it

14      says:  A custom constraint that penalizes plans in

15      which District 6's BVAP is outside the range of 0.45

16      to 0.5, this constraint is given a strength of

17      eight.

18                 Did I read that correctly?

19            A.   Yes.

20            Q.   So what does it mean to have a custom

21      constraint that penalizes certain plans?

22            A.   Oh, I see.  So the custom just means that

23      it's very specific to this particular analysis

24      because you are choosing a specific district,

25      District 6, and choosing a specific range of BVAP so
```

Page 139

1        that's all it means.  It's just a constraint but

2        it's sort of a specific constraint used for this

3        particular analysis as opposed to generic, you know,

4        constraint such as compactness or county splits.

5                        And again, the strength of it is all

6        relative so eight itself doesn't really mean

7        anything and it's basically there to ensure that,

8        you know, most of the simulated plan don't have BVAP

9        of District 6 going outside of that range.

10            Q.    Is that a hierarchical constraint or a

11        soft constraint?

12            A.    No, that's a soft constraint.

13            Q.    So within your final set of 10,000

14        statewide VRA simulation plans, do any place

15        District 6 BVAP outside of that range?

16            A.    So again, similar to the incumbency

17        pairing, there are sometimes that went below

18        45 percent, a very small number, but that was

19        removed from the final 10,000 simulation plans.

20            Q.    Similarly, were there any that went above

21        50 percent?

22            A.    I don't think so although I don't recall

23        the detail, but I don't think so.  It tends to be

24        lower.

25            Q.    So would you agree that keeping the

Page 140

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 1      overall BVAP proportion of District 6 between 45 and

 2      50 percent was a significant factor in the statewide

 3      simulation plans?

 4            A.    Can you clarify what you mean by

 5      significant factor?

 6            Q.    Yeah.  I mean, well, I want to know if

 7      it's a significant factor.  Was it a determinant as

 8      to --

 9                       Well, first of all, it sounds like

10      every plan in your set of 10,000 satisfies that

11      criteria, correct?

12            A.    Right, right.

13            Q.    And any plan that didn't satisfy that

14      criterion is excluded from your set of 10,000

15      statewide simulation plans; is that right?

16            A.    That's right.  That's right.

17            Q.    So no plan outside of that range could

18      have been included in your set of 10,000 simulation

19      plans, correct?

20            A.    That's correct.

21            Q.    So you within your analysis didn't

22      compromise on that factor, correct?

23            A.    That's right.  Compromise meaning -- yeah,

24      that's correct, that constraint was imposed.

25            Q.    And I believe your report says that race
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Kosuke Imai, PhD                                        August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 141

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 1        is a significant factor in the enacted plan.  And so

 2        isn't it also true that this criterion is a

 3        significant factor in your statewide simulation?

 4                    MR. CEPEDA:  Object to form.

 5                    THE WITNESS:  Right.  So my conclusion of

 6        the report says for the statewide simulation

 7        analysis race was a significant factor beyond the

 8        purpose of, you know, keeping this District 6's BVAP

 9        in that range.

10                    So the finding that I observed, basically

11        the difference between enacted plan and simulated

12        plan in terms of racial, you konw, factors that

13        cannot be explained by the possibility of keeping

14        District 6 BVAP in this range, that's what I mean.

15        So that's the purpose of the statewide analysis is

16        to see what I found in the local analysis can be

17        explained by the fact that perhaps District 6's BVAP

18        had to be higher because in the localized analysis,

19        you know, if the BVAP increases in District 1

20        automatically that will reduce the BVAP of

21        District 6.

22                    But in the statewide simulation that's not

23        necessarily the case because I'll make sure that the

24        District 6 BVAP is kept in the same range as the one

25        in the enacted plan.  So then the question is, if I
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Page 142

1      keep -- place that constraint, do I still observe

2      race being -- playing a significant role in

3      determining district boundaries between one and six

4      and then elsewhere.

5           Q.    But in terms -- I'm asking about how the

6      simulation plans are drawn?

7           A.    Uh-huh.

8           Q.    What you described to me makes it sound

9      like this BVAP range in District 6 was a significant

10     factor in how those plans were drawn, correct?

11          A.    It is a significant constraint in the

12     sense that if I don't have that particular

13     constraint the results would have been different,

14     but my conclusion basically says even if you place

15     that constraint the race played a significant role

16     beyond that particular constraint.

17          Q.    Well, and isn't it also a significant

18     constraint because any plan that didn't satisfy that

19     constraint was excluded from your set of 10,000

20     plans, right?

21          A.    That's right.  So if I don't impose this

22     particular constraint the results would have been

23     different sometimes the order -- the analysis be

24     incorporated and so on.

25          Q.    And so this VRA -- satisfying the VRA

Page 143

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 1      constraint was the price of admission for a plan to

 2      be part of your 10,000 plans in the simulation set,

 3      right?

 4           A.   What do you mean by the price of

 5      admission?

 6                MR. CEPEDA:   Object to form.

 7      BY MR. GORE:

 8           Q.   That's a colloquialism.  But let me just

 9      say it this way.  Only plans that satisfied that

10      criterion were included in your set of 10,000,

11      correct?

12           A.   That's correct.

13           Q.   Okay.

14           A.   But there are plans that may satisfy that

15      constraint but still were excluded for other

16      reasons.

17           Q.   Sure, because you have other constraints

18      programmed?

19           A.   Yeah, other constraints, yeah, okay.  I

20      just wanted to make sure.

21           Q.   I think I understand now.

22           A.   That's not the only -- that's not the --

23      like, you know, constraint that dominates everything

24      else.

25           Q.   Did you examine whether race was a
```

Page 144

1      significant factor in any of your statewide

2      simulation plans?

3              A.    Can you repeat that question again?

4              Q.    Sure.  Did you consider or examine whether

5      race was a significant factor in any of your

6      statewide simulation plans?

7              A.    Right, that's what I did.

8              Q.    Well, help me understand that a little

9      bit.  I think that you said that you considered --

10     you used the simulation plan to determine whether

11     the enact -- race was a significant factor in the

12     enacted plan?

13             A.    Oh, simulated plan.

14             Q.    Between the simulated plans did you look

15     at any of those plans to determine whether race was

16     a significant factor in any of those plans?

17             A.    Okay.  I use the simulated plan to

18     evaluate the enacted plan, not the other way around

19     so...

20             Q.    Right.  But did you compare any simulated

21     plan to the set of simulated plans to determine

22     whether any of those plans --

23             A.    Oh, no, I did not evaluate the simulated

24     plans.

25             Q.    Okay.  And did you conduct any of that

Page 145

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 1      kind of analysis with respect to any of the plans

 2      submitted by members of the public?

 3            A.   No.

 4            Q.   So you didn't do it for the NAACP Plan

 5      One?

 6            A.   No.

 7            Q.   Or Plan Two?

 8            A.   I don't even know what these plans are

 9      so...

10            Q.   Okay.

11            A.   Yeah.

12            Q.   You didn't do it for the League of Women

13      Voters' plan?

14            A.   No.

15            Q.   Or Harpootlian plan?

16            A.   No.

17            Q.   All right.  Let's flip back to pages --

18      maybe start around page 15.

19            A.   Okay.

20            Q.   In the statewide simulation here.

21            A.   Okay, 15.  Okay, hold on.

22            Q.   Starting on page -- paragraph 35.

23            A.   Okay.

24            Q.   So here, again, you are analyzing the

25      district boundary in Charleston County, correct?
```

Page 146

1          A.    That's right.

2          Q.    And that's -- the district boundary

3      running through there is Districts 1 and 6, correct?

4          A.    Uh-huh, that's right.

5          Q.    And it says here -- so again, in this

6      analysis -- let's flip over to Figure 5.

7          A.    Yeah.

8          Q.    Okay.  And Figure 5 you have again the

9      cool colored chart that shows the likelihood of a

10     VTD or precinct being placed in District 1; is that

11     right?

12         A.    That's correct.

13         Q.    And again, this is the total number -- do

14     you have -- do you show -- I guess you don't show

15     anything about BVAP here, right?  This is just

16     likelihood of being placed in District 1; is that

17     right?

18         A.    That's correct.

19         Q.    And again, we are seeing that in your

20     model Nancy Mace's portion of Berkeley is being

21     placed very frequently with City of Charleston or a

22     large swath of Charleston County; is that right?

23         A.    Again, I don't have a precise location of

24     her region so I think that's probably right.

25         Q.    Okay.  And again, in this analysis you

Page 147

1      didn't control for which district the VTD was in the

2      benchmark plan, correct?

3           A.    Right, I did not use benchmark plan.

4           Q.    Now, I think in paragraph 35 you say:  On

5      average the BVAP proportion of District 1 under the

6      enacted plan is 6.5 percentage points, 4.5 standard

7      deviations of the simulated distribution lower than

8      the corresponding number under the simulated plans.

9           A.    Uh-huh.

10          Q.    Did I read that correctly?

11          A.    Yes.

12          Q.    So where -- in the simulated plans where

13     is that 6.5 percentage points on average coming

14     from?

15          A.    Yeah, I think my guess, again, I don't

16     have exact numbers but, you know, it's from the City

17     of Charleston and perhaps North Charleston.

18          Q.    And so when it's being moved into

19     District 1 or placed in District 1 under your

20     simulation plans it's necessarily being placed

21     outside of other districts, right?

22          A.    Right.

23          Q.    So it may be coming from District 6, maybe

24     in some of the plans it's coming from District 7

25     even; is that possible?

Page 148

1          A.   That's possible.  Probably from, you know,

2      District 6 in this case.

3          Q.   Yeah, but probably District 6 because

4      District 6 has black voters and District 7 doesn't

5      have as many, right?

6          A.   Right.  That's correct and also District 6

7      is the part that will be, you know, assigned with

8      high probability to District 1 in the Charleston

9      County area.

10         Q.   And so again, in your simulation,

11     statewide simulation --

12         A.   Uh-huh.

13         Q.   Those plans also may crack black voters

14     when they split communities where black voters live

15     just like you localized simulations we discussed

16     before, correct?

17              MR. CEPEDA:  Objection; mischaracterizes

18     testimony.

19              THE WITNESS:  What do you mean by those

20     plans?  The simulated plans?

21     BY MR. GORE:

22         Q.   Yeah, so I think earlier we talked about

23     your definition of cracking.

24         A.   Uh-huh.

25         Q.   And how in changing the line between

Page 149

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 1      District 1 and District 6 various black communities

 2      could be cracked in any individual simulation plan?

 3              MR. CEPEDA:  Object to form.

 4      BY MR. GORE:

 5          Q.   Do you recall that?

 6              MR. CEPEDA:  Object to form.

 7              THE WITNESS:  It's not any individual --

 8      it's just a description of how the district

 9      boundary, you know, runs through a specific group of

10      voters who live in the same area.

11      BY MR. GORE:

12          Q.   Right.  And yeah, so I'm using your -- I'm

13      trying to use your definition of cracking.

14          A.   Okay.

15          Q.   And I think you said that the enacted plan

16      cracks black voters between Districts 1 and 6?

17          A.   Uh-huh.

18          Q.   Because of how the line runs through

19      Charleston or may or may not run through Charleston,

20      correct?

21          A.   Right, right.

22          Q.   And some of the simulation plans also may

23      crack black voters because of how the lines run

24      through certain communities, correct?

25          A.   Right, but my finding is that the
```

Page 150

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 1      simulated plan tend to keep those black voters who

 2      are, you know, cracked by enacted plan tend to keep

 3      them together.

 4           Q.   Correct, but they could possibly -- it

 5      could possibly -- the simulation plans could crack

 6      that community of black voters or some other

 7      community of black voters somewhere else, correct?

 8           A.   It's possible but unless you tell me which

 9      area of black voters, I cannot tell whether the

10      simulated plan or enacted plan cracks that community

11      of voters.

12           Q.   And did you review any of the public

13      testimony or comment in the legislative record for

14      this plan?

15           A.   No.

16           Q.   And did you review any statements by

17      legislators?

18           A.   No.

19           Q.   So paragraph 36 says:  The way in which

20      the enacted plan splits Charleston County by

21      displaying a disproportionately large number of

22      black voters into District 6 is highly unusual in

23      comparison to the simulated plans.  Is that right?

24           A.   Uh-huh, that's correct.

25           Q.   And it seems like a further explanation
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Kosuke Imai, PhD                                    August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 151

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 1      concerns the placement of the City of North

 2      Charleston; is that correct?

 3           A.    Yeah, that's one.

 4           Q.    So if a simulation plan split Charleston

 5      County or North Charleston in a way that affected

 6      where black voters were placed that plan would also

 7      crack voters, correct?

 8           A.    Right, but my finding is that simulated

 9      plan tends to keep them together in one district.

10           Q.    So let's go to Figure 6 on page 17.

11           A.    Right.

12           Q.    And will you explain to me what Figure 6

13      is showing?

14           A.    So Figure 6 shows that a number of, you

15      know, the black voting age population who lives in

16      Charleston County were assigned to District 1.

17      Under the simulated plan which is the bar and the

18      enacted plan which is the vertical line.

19           Q.    And so the difference between the enacted

20      plan and any of the simulated plans is the

21      difference between the line for the enacted plan and

22      the bar or whatever for the simulated plan, correct?

23           A.    That's right, that's correct.

24           Q.    And so in the simulation where are those

25      extra black voters coming from?
```

Page 152

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 1          A.   Well, these are all black voters who live

 2     in Charleston County.

 3          Q.   Okay.  And so they otherwise are being

 4     placed in District 6?

 5          A.   Right, the ones -- that's probably right

 6     although I haven't, you know, examined every

 7     simulated plan.

 8          Q.   And so these black voters are being placed

 9     in District 1 and not in District 6 or some other

10     district, correct?

11          A.   Right, so this shows the black voters who

12     are assigned to District 1 on the simulated plan.

13          Q.   Okay.  And did you generate a similar

14     histogram for what happens with black voters in

15     District 6?

16          A.   Black voters in Charleston County or black

17     voters in general?

18          Q.   How about Charleston County since that's

19     what you have here in Figure 6?

20          A.   Yeah, I didn't create that because in most

21     simulated plans the rest of the black voters who

22     live in Charleston County would be placed in

23     District 6, I think.

24          Q.   Okay.  So at least with respect to most of

25     the simulation plans the enacted plans places more
```

Kosuke Imai, PhD                                      August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 153

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 1     black voters from Charleston County in District 6

 2     than the simulation plan, correct?

 3          A.   I think that's right.  Although, you know,

 4     again, it's possible that some other districts come

 5     in play and I have not checked every -- every

 6     district to make sure that's, you know, that's --

 7     how often that happens.

 8          Q.   But each district in your simulation plan

 9     is constrained to some extent by where the incumbent

10     lives, correct?

11          A.   Oh, yes, because I tried to avoid the

12     incumbent pairing so that's right.

13          Q.   So for another district to move into

14     Charleston your simulation plan would have to

15     somehow still be contiguous ultimately?

16          A.   That's right.

17          Q.   To the precinct where in incumbent

18     resides, right?

19          A.   Yeah, I think for any simulated plan for

20     District 6 it would be definitely in play and maybe

21     additional districts like District 7 may also play

22     on the eastern side but most likely it would be

23     District 6.

24          Q.   And given that it's most likely that the

25     enacted plan places more black voters in District 6
```

Page 154

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 1      than the simulation plans, right, in Charleston

 2      County?

 3           A.   Oh, in Charleston County, yes, because you

 4      know, that's just -- there is a fixed number of

 5      black voters in Charleston County and if there are

 6      more in District 1 than there is in the rest of the

 7      other districts.

 8           Q.   And so paragraph 37 --

 9           A.   Uh-huh.

10           Q.   You say there is a sentence that begins,

11      in fact:  In fact, a large spike around 74,600

12      implies a vast majority of simulated plans,

13      76.3 percent assigned the entire county to

14      District 1.

15                Did I read that correctly?

16           A.   Yeah, that's correct.

17           Q.   Do you know whether Charleston County was

18      split in the benchmark plan?

19           A.   Oh, in the benchmark plan.  In the enacted

20      plan it was but I don't know the benchmark plan.

21           Q.   And if a map drawer preferred to keep

22      Charleston County split he would have rejected plans

23      that made it whole in District 1, correct?

24           A.   Again, I don't have any opinion on how or

25      why map drawer made certain decisions.
```

Page 155

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 1          Q.   And again, you didn't review any public

 2     testimony, comment or legislative testimony about

 3     splitting or repairing the split in Charleston

 4     County, correct?

 5          A.   No.

 6          Q.   And did you analyze the political effect

 7     of placing all of Charleston County in District 1

 8     with Nancy Mace?

 9          A.   I did not use any partisan data in my

10     analysis.

11          Q.   And did you analyze what changes to the

12     map would have been required in other parts of the

13     state if all the Charleston was placed in

14     District 1?

15          A.   Can you repeat the question again?  Sorry.

16          Q.   Sure.  So if you -- Charleston County, if

17     you place Charleston County in District 1?

18          A.   Uh-huh.

19          Q.   In the enacted plan, you would have to

20     make changes to other districts in order to equalize

21     population, correct?

22          A.   That's correct.

23          Q.   All right.  And did you do any analysis of

24     that other than to recognize if that's true?

25          A.   Yeah, that's true but I didn't do any
```

Page 156

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 1    specific analysis with -- regarding that particular

 2    point.

 3          Q.    Now, your statewide simulation analysis

 4    with respect to District 1 and District 6 you have

 5    this discussion of Charleston County, right?

 6          A.    Uh-huh.

 7          Q.    Did you also examine in your statewide

 8    simulation analysis Dorchester County?

 9          A.    No.

10          Q.    How about Colleton County?

11          A.    No.

12          Q.    Or Jasper County?

13          A.    No.

14          Q.    Okay.  Why did you not examine Dorchester

15    County?

16          A.    Well, so my -- you know, analysis, the

17    entire analysis for this report started with

18    examining, you know, District 1 and 6, that's the

19    first part of the analysis District 1 and 6

20    boundaries and what I found there is that it's

21    Charleston County where I see the largest difference

22    in terms of the role that the race played between

23    the simulated plan and enacted plan.

24                     And so what I wanted to then do is,

25    you know, that is really the start of the analysis.
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Page 157

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 1      And the other two analyses, the second race analysis

 2      and statewide analysis, is to make sure that the

 3      results are robust to other factors.

 4                     So for the second race run analysis I

 5      wanted to make sure that it was actually the

 6      Charleston, the way Charleston County was split, not

 7      necessarily, you know, other parts of Districts 1

 8      and 6 so that's why I froze the other parts of the

 9      Districts 1 and 6.

10                     And for this analysis I wanted to

11      make sure that it wasn't due to this particular

12      constraint about keeping the BVAP proportion for

13      District 6 at a certain level so each of these

14      analyses sort of tried to look at the robustness of

15      the initial analysis that I conducted where I show

16      that there are just differences coming from

17      District 1 and District 6 boundaries.

18           Q.   And do you know one way or the other

19      whether Dorchester, Colleton and Jasper are split

20      between Districts 1 and District 6 in the enacted

21      plan?

22           A.   I don't recall which other counties are

23      being split.

24           Q.   Let's turn to page 18 of your report.

25           A.   Okay.
```

Page 158

```
 1          Q.    And we'll discuss the line here in

 2     Richland County.

 3          A.    Uh-huh.

 4          Q.    Between District 2 and District 6.

 5          A.    Sure.

 6          Q.    First of all, do you know whether Richland

 7     County was split in the benchmark plan?

 8          A.    Yes, you can see it's -- oh, in the

 9     benchmark plan I don't know.  In the enacted plan

10     they are split.

11          Q.    And you see the -- if we look at Figure 7.

12          A.    Right.

13          Q.    District 2 and District 6 are shown here

14     with a line in what appears to be Richland County;

15     is that correct?

16          A.    Yeah, Richland County is demarked by the

17     gray, thick line there.

18          Q.    And are you aware of any explanations for

19     the shape of the boundary between Districts 2 and 6

20     in Richland County?

21          A.    No.

22          Q.    And again, you have not reviewed the

23     public record of the legislative record on that,

24     have you?

25          A.    No.
```

Page 159

```
 1            Q.   So let's go to paragraph 40.

 2            A.   Okay.

 3            Q.   I believe it's actually on page 19.

 4            A.   Okay.

 5            Q.   You start:  In fact, 39.4 percent of the

 6       simulated plans did not split Richland County at all

 7       and all the simulated plans assign the entire county

 8       to District 6.

 9                 Did I read that correctly?

10            A.   That's correct.

11            Q.   And if a map drawer would have preferred

12       to keep Richland County split, he would have

13       rejected plans that make it whole in District 2,

14       correct?

15            A.   That's right.  Although I don't know what,

16       you know, the map drawer considered.

17            Q.   And did you analyze the political effect

18       of placing all of Richland County in District 6?

19            A.   No, I didn't use partisan information if

20       that's what you mean by political.

21            Q.   Thank you.  Or any election result

22       information?

23            A.   No.

24            Q.   All right.  So page 19 contains Figure 8?

25            A.   Uh-huh.
```

Kosuke Imai, PhD                                    August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 160

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1          Q.   Would you explain to me what Figure 8 is

2     about?

3          A.   Right, so this is similar to the previous

4     figure where I look at, you know, among the black

5     voting age population who live in Richland County

6     how many of them are assigned to District 2.

7          Q.   And is this a total number of black voting

8     age population or percentage?

9          A.   Yes, that's right.  And this is among the

10    plans that split into Districts 2 and 6 so it does

11    not include the one that assigned the entire county

12    to the district.

13         Q.   Okay.

14         A.   So it's focused on the subset.

15         Q.   And so according to this, this shows that

16    district -- that the enacted District 2 places more

17    individuals of black voting age -- black individuals

18    of voting age from Richland County in District 2

19    then the average statewide simulation plan that also

20    splits Richland between Districts 2 and 6, correct?

21         A.   That's right, that's right.

22         Q.   So what would a histogram of District 6,

23    the corresponding histogram of District 6 look like

24    to Figure 8?

25         A.   Oh, I see.  Well, as I said, you know,
```

Page 161

```
 1      40 percent, about 40 percent of the simulated plans

 2      assigned the entire Richland County to District 6

 3      so, you know, it -- in that case, you know, all the

 4      BVAP population would be in District 6 and even in

 5      the cases where the simulated plans split Richland

 6      County, they assigned, you know, much fewer BVAP to

 7      District 2, excuse me, than the enacted plan.  So

 8      yeah, I think a lot of Richland County BVAP would be

 9      in Richland County, in District 6.

10           Q.    District 6?

11           A.    Yeah.

12           Q.    So if I can just summarize that.

13           A.    Yeah.

14           Q.    The simulation plans assigned lower BVAP

15      to District 2 but higher BVAP to District 6 compared

16      to the enacted districts in those simulation plans

17      that split Richland County between Districts 2 and

18      6; is that correct?

19           A.    That's correct, that's exactly right.

20           Q.    And if we were to show that as a histogram

21      to District 6 it would be the mirror image of what

22      we see here in Figure 8 accounting for small

23      population variations in your model?

24           A.    That's probably right.  Except I don't

25      know how often the other districts are split but my
```

Page 162

```
 1        sense is that most of the simulated plans involve

 2        Districts 2 and 6 for this county so that's probably

 3        correct although I don't have, you know, exact

 4        numbers with me.

 5              Q.   Well, I'm glad you raise that because I

 6        think paragraph 40 says that 39.4 percent of the

 7        simulated plans don't split Richland at all?

 8              A.   Right, right.  So in that case all --

 9              Q.   So in that case -- right, and then

10        paragraph 41 says:  23.9 percent of simulated plans

11        divide Richland into two and six?

12              A.   Right, so there are some.

13              Q.   Yeah, and so I understood Figure 8 to

14        relate only to that 23.9 percent referenced in

15        paragraph 41, right?

16              A.   That's exactly right.  That's why it's

17        2388 plans.

18              Q.   I've got it.

19              A.   Yeah.  So there are some districts --

20        sorry, there are some simulated plans that would

21        involve some other districts.

22              Q.   So there is a third category of simulated

23        plans that split Richland between two districts but

24        not two and six?

25              A.   Or three and six.  Possibly three and six.
```

Kosuke Imai, PhD                                      August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 163

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 1     Yeah, I don't know, yeah.
 2          Q.   Yeah, you just don't know?
 3          A.   Right.
 4          Q.   But that's a category?
 5          A.   Yeah, yeah.
 6          Q.   But at least the 23.9 percent split
 7     between two and six?
 8          A.   That's right.
 9          Q.   We have Figure -- so we have Figure 8 for
10     the District 2 BVAP and the District 6 BVAP would be
11     the mirror image of that simply control for
12     population variation that your model tolerates,
13     right?
14          A.   That's right.  For this subset, yes.
15          Q.   For this 23.9 percent subset?
16          A.   That's right.  That's right.
17          Q.   Okay.  Now, you mind flipping back to
18     page 15, Figure 4?
19          A.   Okay.
20          Q.   So when you are discussing in your
21     statewide simulation the line between District 1 and
22     6 in Charleston you provided us this BVAP proportion
23     table, the histogram?
24          A.   Uh-huh.
25          Q.   But I didn't see a similar BVAP proportion
```

Kosuke Imai, PhD                                    August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 164

```
 1      histogram for any district in your discussion of

 2      Richland County, so back on pages 18 or 19 --

 3           A.    Uh-huh.

 4           Q.    There wasn't the same kind of histogram.

 5           A.    Of this district you are talking about?

 6           Q.    For District 2 or District 6.

 7           A.    Oh, I see.  Well, District 6 BVAP

 8      proportion is constrained to between 45 and 50 so

 9      that's not, you know, that's just by design

10      constrained.  District 2, yeah, I don't show BVAP

11      proportion.

12           Q.    Is there a reason for that?

13           A.    Because here I'm just focusing on how

14      unusual it is -- just like for this case how unusual

15      it is to split this particular county in a certain

16      way.

17           Q.    And have you examined District 2's BVAP in

18      your statewide simulation plans?

19           A.    No, because that's not the goal of this

20      particular analysis here.

21           Q.    And have you examined whether your

22      statewide simulation plans or any particular

23      statewide simulation plan cracks black voters in

24      Richland County?

25           A.    Can you repeat that question again, sorry.
```

Page 165

```
 1            Q.    Sure.  Using your definition of cracking?

 2            A.    Uh-huh.

 3            Q.    Have you examined whether any of your

 4      statewide simulation plans crack black voters in

 5      Richland County?

 6                  MR. CEPEDA:  Object to form.

 7                  THE WITNESS:  I mean, compared to the

 8      enacted plan, the simulated plan tends to keep them

 9      together.  Like for example, like 40 percent of them

10      keep all the counties together in the same district

11      so that's -- there is no split at all.  And even in

12      other 26.9 percent of the cases, you know, they tend

13      to -- most of the BVAP population tend to be on

14      District 6 so that's what this is showing with

15      respect to the cracking of black voters in Richland

16      County.

17      BY MR. GORE:

18            Q.    And is it possible as we discussed before

19      that the simulation plan cracks black voters in

20      Richland County with how it draws the district line

21      through that county and through a black community?

22                  MR. CEPEDA:  Object to form.

23                  THE WITNESS:  Are you talking about the

24      remainder of the simulated plans beyond the

25      40 percent and 24 percent of them or are you --
```

Page 166

1      BY MR. GORE:

2           Q.   Or even the 24 percent.  I mean, I take it

3      that there is a 39.4 percent that doesn't crack in

4      Richland at all.

5           A.   Right, that's right.

6           Q.   But I'm just asking and I think you've

7      answered this a few times now and I don't mean to

8      belabor the point, but more broadly speaking under

9      your definition of cracking, cracking is simply

10     splitting a community of black voters into more than

11     one district, correct?

12          A.   Right, but there is a different degree of

13     cracking, right, you know, what's the percentage or

14     what's the, you know -- like it's one thing to split

15     a community into two districts by taking one person

16     out of that community but it's another thing to

17     split the community into say two halves.

18          Q.   And where in your report do you discuss

19     the degree of cracking?

20          A.   So this Richland County BVAP basically

21     shows that, like this analysis shows, that say

22     40 percent of the cases they are in, you know,

23     basically 100 percent is in one district and even in

24     the 33.9 percent of the case that there are a lot

25     fewer BVAP being assigned to District 2.  A lot of

Page 167

1       them very close to zero so that means that most of

2       them, most of the black voters would be in

3       District 6 and those -- that would spike that's

4       almost accounting for 50 percent out of that

5       24 percent.

6             Q.    And at the same time in Figure 8 there is

7       some simulation plans that place more black voters

8       from Richland in District 2 than the enacted plan,

9       correct?

10            A.    Right.  So this is statistics knowledge,

11      this you really want to look at the distribution of,

12      you know, simulated plans as opposed to focusing on

13      one and two specific simulated plans.

14            Q.    And --

15            A.    And that's the goal of the analysis, the

16      statistics analysis.

17            Q.    Let's step back from Richland County for a

18      moment.  I want to ask just a more global

19      question --

20            A.    Sure.

21            Q.    About the simulation.  Is it possible that

22      plans in your statewide simulation crack black

23      voters by splitting their communities into more than

24      one district?

25            A.    It depends on the community.  So I don't

Page 168

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 1      know unless you specify specific communities I won't

 2      know whether simulated plan would split that

 3      community.

 4           Q.   But you didn't program the simulation, for

 5      example, with a constraint against splitting black

 6      communities, did you?

 7           A.   No but to the extent that, you know,

 8      keeping the BVAP proportion of District 6 to be in

 9      certain race that definitely encourages certain

10      number of black voters to be placed in District 6 to

11      the extent that I try to, you know, reduce the

12      number of county splits, municipalities splits and

13      depending on how the black voters are, you know,

14      there are geographical distribution that may have an

15      impact on whether those communities are being split

16      and if they are how.

17           Q.   So in the enacted plan are there any other

18      counties that are split between Districts 2 and 6

19      other than Richland?

20           A.   Oh, yeah, I'm sure there are.  Yeah, I

21      don't recall exactly what those counties are.

22           Q.   Okay.  Did you analyze the district

23      boundary between Districts 2 and 6 in Orangeburg

24      County?

25           A.   I don't think so.
```

Kosuke Imai, PhD                                    August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

Page 169

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 1            Q.    And why not?

 2            A.    I don't recall the reason.  I mean, the

 3     draft report may have included.  Again, I don't

 4     recall, you know, whether I did it or whether that

 5     was included in the draft reports or, you know, if I

 6     didn't do it why I didn't do it.  I don't -- I don't

 7     recall.

 8            Q.    Let's move to your analysis of Sumter

 9     County.

10            A.    Okay.

11            Q.    Which is split between Districts 5 and 6

12     of the enacted plan; is that correct?

13            A.    Yes, that's correct.

14            Q.    And do you know why Sumter -- well, first

15     of all, do you know whether Sumter was split in the

16     benchmark plan?

17            A.    No, I don't know.

18            Q.    And do you know why Sumter was kept split

19     in the enacted plan?

20            A.    No, I don't know.

21            Q.    Paragraph 43 --

22            A.    Uh-huh.

23            Q.    And Table One shows that 90.3 percent of

24     simulated plans make Sumter whole and place it in

25     District 6; is that correct?
```

Page 170

1    A.    Yes, that's correct.

2    Q.    And if a map drawer preferred to keep a

3    portion of Sumter County in District 5 he would have

4    rejected all of those plans, correct?

5    A.    Right.  Although I didn't consider the map

6    drawers in my analysis.

7    Q.    And you also didn't consider any public

8    testimony or comment or the legislative record on

9    this split, did you?

10    A.    No, I didn't.

11    Q.    And did you analyze the political effect

12    of placing all of Sumter County in District 6?

13    A.    No, I didn't use partisan information or

14    election results.

15    Q.    And here when you are discussing Sumter

16    County you didn't include any histogram showing BVAP

17    numbers or BVAP proportions?

18    A.    Uh-huh.

19    Q.    What is the number of black individuals of

20    voting age implicated by the split in Sumter County,

21    do you know?

22    A.    Oh, I don't know off the top of my head,

23    but I didn't include them because, you know,

24    90 percent of the whole county is in District 6 so

25    it's obvious that simulated plan keep those people

Page 171

```
 1      together most of the time.

 2           Q.    And did you analyze the effect of keeping,

 3      placing Sumter County whole in District 6 on any

 4      district's BVAP proportion or total BVAP?

 5           A.    Oh, how that affects the BVAP proportion

 6      of other districts?

 7           Q.    Or any district.

 8           A.    Okay.  I didn't do that.  I didn't look at

 9      that.

10           Q.    All right.

11           A.    Although by construction, again, the

12      District 6 will maintain that specified level of

13      BVAP proportion so I know that it does not affect

14      the BVAP proportion of District 6.

15           Q.    And within your model District 6 could

16      have a range of BVAP between 45 and 50 percent,

17      right?

18           A.    That's correct, yeah.

19           Q.    And so if District 6's BVAP in the

20      simulation plan is 50 percent that means accordingly

21      that there is 3 percent less BVAP for other

22      districts, correct?

23                 MR. CEPEDA:  Object to form.

24                 THE WITNESS:  3 percent of the District 6

25      population, right.
```

Page 172

```
 1      BY MR. GORE:

 2          Q.    So in the --

 3          A.    Come from other districts, is that what

 4      you mean?

 5          Q.    Yeah, so in the enacted plan District 6

 6      BVAP is I think 46.9 percent; does that sound about

 7      right?

 8          A.    I trust you.

 9          Q.    Okay.  Let's just for -- and this is just

10      a conceptual point so the numbers are not as

11      important, but a simulated plan with a 49.9 percent

12      BVAP means that that's 3 percent higher than the

13      enacted plan, correct?

14          A.    Uh-huh.

15          Q.    And that 3 percent is being drawn from

16      other districts other than District 6, correct?

17          A.    That's correct but we should also remember

18      that ranges go from 45 to 50 and there are more

19      districts, there are more simulated plans that are

20      on the lower end so I had to remove some of the

21      plans that don't reach, excuse me, don't reach the

22      45 percent and so there may be a district that has

23      BVAP of, you know, close to 50 percent for

24      District 6 and in a simulated plan, there is also a

25      lot of plans that are closer to the BVAP proportion
```

Page 173

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 1      for District 6 that is closer to 45 percent and less

 2      than enacted plan number.

 3              Q.    And do you know the average BVAP

 4      proportion for your 10,000 plans in the statewide

 5      VRA simulation?

 6              A.    I don't recall.

 7              Q.    All right.  I'm going to mark a new

 8      exhibit.

 9              A.    Okay.

10              Q.    It's tab eight in your zip file.

11              A.    Yeah.

12              Q.    I'm going to mark it as Exhibit Eight.

13                    (Defendant's Exhibit No. 8, REBUTTAL REPORT

14      OF SEAN P. TRENDE, was marked for identification.)

15                    THE WITNESS:  This is the rebuttal.

16      BY MR. GORE:

17              Q.    Yes.  It's the rebuttal report by

18      Mr. Trende?

19              A.    Yes.

20              Q.    Dr. Imai, do you recognize this document?

21              A.    Yes, I was given this document by counsel.

22              Q.    And when were you given it by counsel?

23              A.    Oh, I don't recall the exact date.  I

24      think it's very recent.  Maybe two weeks ago or

25      something along those lines, but yeah, I don't
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Page 174

```
 1      recall exact date.

 2           Q.   Okay.  But it was -- I believe the date of

 3      this report is, I'll scroll to the last page,

 4      May 4th?

 5           A.   May 4th, okay.

 6           Q.   So you don't recall receiving it in May

 7      2022 it sounds like?

 8           A.   Yeah, I just -- like I think it was two or

 9      three weeks ago when counsel sent me as a part of

10      the exhibits.  I didn't remember and so that doesn't

11      necessarily mean I didn't have it, but I just don't

12      pay attention, I guess, if I had it.

13           Q.   Okay.  And you've not offered an opinion

14      on any of Mr. Trende's analysis in this case,

15      correct?

16           A.   No, I didn't.  I did not.

17           Q.   And you have not offered an opinion on any

18      of his analysis in his rebuttal report?

19           A.   No, I did not and I also wasn't asked

20      so...

21           Q.   Okay.  And did you attempt to recreate the

22      numbers that Mr. Trende or the statistics that

23      Mr. Trende provides in his rebuttal report?

24           A.   No, I did not attempt.

25           Q.   And at this point do you plan to do so?
```

Kosuke Imai, PhD                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 175

1          A.    I don't think so.

2          Q.    Okay.  And as you sit here today, do you

3     dispute any of the calculations in Mr. Trende's

4     report?

5          A.    I haven't formed an opinion on this so I

6     can't -- I can't make any judgment about accuracy or

7     validity of his analysis.

8          Q.    And likewise, you haven't formed any

9     opinion about his rebuttal report, correct?

10         A.    Wait, are you talking about the previous

11    report or the rebuttal report?  I'm a little

12    confused.

13         Q.    I was talking about the rebuttal, but I

14    wanted to make the record clear.

15         A.    Oh.

16         Q.    I think I called it his report rather than

17    his rebuttal report.

18         A.    Okay.

19         Q.    So I'm glad that you and I were equally

20    confused by my poor question.  So let me ask the

21    question a little bit more cleanly for the record if

22    that's okay.

23         A.    Sure, sure.

24         Q.    Have you formed any opinions about

25    Mr. Trende's rebuttal report?

Page 176

1           A.   No.

2           Q.   Or any of the statistics or numbers he

3     provides in his rebuttal report?

4           A.   No, I have not formed opinions on those.

5           Q.   So on page 2 of this rebuttal report

6     through page 5 Mr. Trende discusses core retention

7     and offers a variety of statistics about core

8     retention.

9           A.   Uh-huh.

10          Q.   And so you have not formed -- you have not

11    analyzed or formed any opinions about Mr. Trende's

12    discussion of core retention in this rebuttal

13    report, correct?

14          A.   I have not analyzed nor formed opinion on

15    that.

16          Q.   And Mr. Trende, starting on page 5 through

17    page 8 discusses politics and partisanship?

18          A.   Uh-huh.

19          Q.   And you have not formed any opinions or

20    done any analysis on Mr. Trende's statistics here

21    either?

22          A.   No.  Yeah, I have not done that and I

23    haven't formed opinion on that.

24          Q.   And similarly, on page 8 Mr. Trende refers

25    to movement of citizens or voters to repair precinct

Kosuke Imai, PhD                                      August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 177

 1      splits and you haven't analyzed or formed an opinion

 2      about that either, have you?

 3              A.   No, yeah.

 4                   MR. GORE:  Let's go off the record here

 5      for a moment.

 6                        (A recess was taken.)

 7                   MR. GORE:  Dr. Imai, did you discuss your

 8      deposition with anyone during the break?

 9                   THE WITNESS:  No.

10                   MR. GORE:  Dr. Imai, thank you for your

11      attentiveness today.  I have no further questions.

12      I'm now passing the witness.

13                   Andrew or Ms. Crum, anyone have questions

14      for Dr. Imai?

15                   MS. CRUM:  This is Liz Crum.  No, we have

16      no questions on behalf of the Election Commission

17      defendants.

18                   MR. MATHIAS:  This is Andrew Mathias, on

19      behalf of the House Defendants.  I have no

20      questions.

21                   MR. CEPEDA:  Thank you.  I guess, I have a

22      few questions.

23                        EXAMINATION

24      BY MR. CEPEDA:

25              Q.   Dr. Imai, just a second.  Dr. Imai, you

Page 178

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 1      testified that you drafted a single report on the

 2      Congressional map in this case, right?

 3           A.    There is only one final report, yes.

 4           Q.    So from the time that you started working

 5      on simulations having to do with the Congressional

 6      map you meant those to form part of the same report,

 7      right?

 8           A.    Right, right.

 9           Q.    And did you mention at some point an early

10      draft included simulations that had to do with the

11      benchmark map, right?

12           A.    Right, I think there may have some

13      simulation results.

14           Q.    Yeah, and it sounded like you mentioned

15      that you may have discussed that draft with your

16      lawyers, right?

17           A.    That's correct.

18           Q.    With me, for example?

19           A.    Yeah, I think you and I know Patricia was

20      there, Ms. Yan was there, and there may have been

21      some others.

22           Q.    I've got it.  And the lawyers or can I

23      recall we gave you our impressions and shared our

24      thoughts of what we were seeing?

25           A.    Right.
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Page 179

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 1                MR. GORE:   Object to the form.

 2        BY MR. CEPEDA:

 3            Q.    And at some point I believe you testified

 4        those simulations involving the benchmark plan got

 5        cut from later drafts, right?

 6            A.    That's correct.

 7            Q.    But you didn't share those drafts with

 8        anyone besides plaintiffs counsel in this lawsuit or

 9        their staff, right?

10            A.    That's correct.

11            Q.    Dr. Imai, earlier Mr. Gore asked you

12        whether you had looked at any maps proposed by the

13        public and you noted that you don't even know what

14        those maps are; am I right?

15            A.    Right.  I did not -- yeah, I don't know

16        what they are.

17            Q.    Is it possible that you could have looked

18        at other maps that were not enacted at some point

19        even if you don't recognize them now by name or

20        label?

21            A.    Oh, hum.  Yeah, I don't -- you know, I

22        don't recall looking at them.  I guess that's --

23        but, you know, that's based on my recollection.

24            Q.    That's fine.  Thank you.  But were any

25        un-enacted maps discussed in your final report?
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Page 180

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 1          A.    No, I look at the enacted plan.

 2          Q.    Thank you.  You answered my next question.

 3                 So Dr. Imai, you base your simulation

 4    constraints on the published South Carolina

 5    guidelines for the House and Senate, right?

 6          A.    Yeah, I don't know whether they are

 7    published but those two guidelines that were given

 8    to me.

 9          Q.    And in those two guidelines was there any

10    indication, for example, that core preservation

11    should be prioritized over other criteria?

12          A.    No.  I believe that it was listed as

13    additional constraint in Senate guideline I think

14    and may not be even directly mentioned in the House

15    guideline or at least it was not priority, listed as

16    a priority.

17          Q.    Thank you.  And you testified -- well, why

18    did you choose not to incorporate core preservation,

19    if you can explain again?

20          A.    Right.  So the goal of my analysis, the

21    entire report, the goal of the entire report was to

22    examine whether race played a significant role in

23    drawing district boundaries of the enacted plan and,

24    if so, how that happened.  And to do that I need to

25    isolate the impact of race, like the role that race
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Page 181

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 1      played from other traditional redistricting criteria

 2      and some of the rules in the -- mentioned in the

 3      guideline.

 4                      If I incorporate any product does not

 5      have to be benchmark plan, but if I incorporate any

 6      plan in my simulation analysis, it will basically

 7      carry all the factors that went into that particular

 8      plan.  So in order to isolate the race as a factor I

 9      did not use this through my analysis that I did not

10      use any plan including the previous plan.

11           Q.   Thank you.  Now, you recall Mr. Gore asked

12      you some questions about the use of partisanship

13      data in your simulation, right?

14           A.   Yes.

15           Q.   And you explained that you didn't do

16      any -- you didn't use partisanship information; is

17      that right?

18           A.   Right.

19           Q.   And we just covered this, but you read the

20      guidelines, right?

21           A.   Uh-huh, yes, I did.

22           Q.   Did anything in the guidelines suggest to

23      you that your simulation should have accounted for

24      Nancy Mace's election chances, for example?

25           A.    I didn't see any mention of that.  Yeah, I
```

Page 182

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 1      did not see any specific instruction about use of

 2      election outcomes.

 3           Q.   Did anything suggest to you that it was

 4      important for the map makers to enact a map that

 5      favored Republicans?

 6           A.   I don't analyze intent of map drawer so I

 7      can't, you know, say what they have thought about

 8      but the guideline didn't specify, you know, specific

 9      use of electoral outcome or electoral chance of

10      politicians and that wasn't, you know, even -- a

11      political consideration wasn't an additional

12      consideration and so I took other more traditional

13      redistricting criteria as priority.

14                MR. CEPEDA:   Thank you, Dr. Imai.  I have

15      no more questions.

16                     EXAMINATION

17      BY MR. GORE:

18           Q.   I have just a couple of questions of

19      redirect, Dr. Imai.

20           A.   Okay.

21           Q.   Now, you said you haven't attempted to

22      analyze the intent or motives of the map drawer or

23      legislators, correct?

24           A.   That's correct.

25           Q.   And so you don't have an opinion one way
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Kosuke Imai, PhD                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 183

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 1     or the other as to whether the map drawer or the

 2     legislators considered politics even if politics is

 3     not in the guidelines, correct?

 4          A.   That's right.  I don't have any opinion on

 5     that.

 6          Q.   Do you have a view or opinion on whether

 7     the map drawer or the legislators considered Nancy

 8     Mace's reelection prospect whether or not that's

 9     listed in the guidelines?

10          A.   No, I don't have any opinion on that.

11          Q.   And do you have any opinion or view on

12     whether the map drawer or legislators wanted a plan

13     that would elect six Republicans regardless of

14     whether that's in the guidelines?

15          A.   I don't have any opinion on that.

16          Q.   And Dr. Imai, is keeping Charleston in a

17     single district anywhere in the guidelines?

18          A.   I don't think so, there is no specific

19     counties being mentioned.

20          Q.   How about keeping Richland in a single

21     district?

22          A.   I don't think so.

23          Q.   And how about keeping District 6's BVAP

24     between 45 percent and 50 percent?

25          A.   Those numbers are not specifically
```

Kosuke Imai, PhD                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

Page 184

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 1      mentioned but the VRA consideration is listed as one

 2      of the principles that should be followed.

 3           Q.   And you don't have a view, do you, as to

 4      whether a District 6 between 45 percent and

 5      50 percent BVAP complies with the VRA, right?

 6           A.   I'm not a lawyer so I don't make legal

 7      judgment.

 8           Q.   And you haven't conducted any racially

 9      polarized voting analysis in this case, correct?

10           A.   No, that's right.  I did not conduct

11      racial polarize analysis.

12                MR. GORE:  Thank you, Dr. Imai.  I have no

13      further questions.

14                MR. CEPEDA:  I think that might be it.

15      That's it unless Liz or Andrew -- I've spoken out of

16      turn but I hope not.

17                MR. MATHIAS:  I'm not going to disappoint

18      you.  No questions.

19                THE COURT REPORTER:  Dr. Imai, will you

20      read and sign?  If so, where can we email that?

21                MR. CEPEDA:  He will and you can send it

22      to me.

23                THE COURT REPORTER:  To you, okay.

24                All right.  Mr. Gore, regular turnaround

25      which is the 22nd; is that correct?
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Page 185

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 1                    MR. GORE:  What can you do as an expedited

 2      turnaround?

 3                    THE COURT REPORTER:  So I can get it to

 4      you by Monday or do you need it before that?  I can

 5      also provide you with a rough draft.

 6                    MR. GORE:  Yeah, Monday would be fine and

 7      we are happy to take a rough too, I guess.

 8                    THE COURT REPORTER:  Okay.

 9                    Mr. Cepeda, would you also like it

10      expedited and a rough draft?

11                    MR. CEPEDA:  Monday would be good for me

12      and we can work the details.

13                    THE COURT REPORTER:  I don't know what you

14      mean.  Do you want a rough tomorrow or no?

15                    MR. CEPEDA:  I would like the rough too,

16      sure.

17                    THE COURT REPORTER:  Okay.  Do you want

18      your copy Monday too?

19                    MR. CEPEDA:  I don't need it by Monday.

20      Does that have any additional cost?

21                    THE COURT REPORTER:  Yes, it does.

22                    MR. CEPEDA:  So when would I get the

23      regular?

24                    THE COURT REPORTER:  That would be the

25      22nd.
```

Page 186

 1                MR. CEPEDA:  No, we want it before that so

 2      I'll take it Monday as well.

 3                THE COURT REPORTER:  Okay.

 4                Ms. Crum?

 5                MS. CRUM:  We do not need a transcript.

 6                THE COURT REPORTER:  Okay.

 7                Mr. Mathias?

 8                MR. MATHIAS:  I guess it is peer pressure,

 9      but we will take it Monday.

10                THE COURT REPORTER:  And do you want a

11      rough?

12                MR. MATHIAS:  Yes.

13                THE COURT REPORTER:  Okay.  Thank you.

14                (The deposition concluded at 4:32 p.m.)

15                (The witness, after having been advised of

16      his right to read and sign this transcript, does not

17      waive that right.)

18

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Page 187

1                    CERTIFICATE OF REPORTER

2

3           I, Solange Ruiz-Uribe, Notary Public for the

4    State of South Carolina at Large, do hereby certify

5    that the foregoing transcript is a true, accurate, and

6    complete record.

7           I further certify that I am neither related to

8    nor counsel for any party to the cause pending or

9    interested in the events thereof.

10          Witness my hand, I have hereunto affixed my

11   official seal this 8th day of August, 2022 at Fort

12   Mill, York County, South Carolina.

13

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23                              _____

24                              Solange Ruiz-Uribe

                                My Commission expires

25                              February 2, 2027

Page 188

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 1                        I N D E X

 2                                        Page/Line

 3      WITNESS EXAMINATION

 4      KOSUKE IMAI, PhD                    4        1

 5      EXAMINATION

 6      BY MR. GORE                         4        3

 7      EXAMINATION

 8      BY MR. CEPEDA                     177       23

 9      EXAMINATION

10      BY MR. GORE                       182       16

11      SIGNATURE OF DEPONENT

12      CERTIFICATE OF REPORTER           187        1

13

14

15

16              REQUESTED INFORMATION INDEX

17

18          (No Information Index Requested)

19

20

21

22

23

24

25
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Page 189

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 1                        E X H I B I T S
 2                                          Page/Line
 3      DEFENDANT'S EXHIBITS
 4      EXHIBIT 1       SENATE DEFENDANTS'        9        20
                        AMENDED NOTICE OF TAKING
 5                      VIDEO CONFERENCE
                        DEPOSITION OF KOSUKE
 6                      IMAI, PHD
 7      EXHIBIT 2       EXPERT REPORT OF KOSUKE  16         9
                        IMAI, PH.D. DATED
 8                      APRIL 4, 2022
 9      EXHIBIT 3       JUNE 2022 CURRICULUM     19         3
                        VITAE OF KOSUKE IMAI
10
11      EXHIBIT 4       SEQUENTIAL MONTE CARLO   34         3
                        FOR SAMPLING BALANCED
12                      AND COMPACT REDISTRICTING
                        PLANS PAPER
13
14      EXHIBIT 5       RECOMBINATION: A FAMILY  65         9
                        OF MARKOV CHAINS FOR
15                      REDISTRICTING ARTICLE
16      EXHIBIT 6       SOUTH CAROLINA HOUSE OF  68        16
                        REPRESENTATIVES JUDICIARY
17                      COMMITTEE REDISTRICTING
                        AD HOC COMMITTEE 2021
18                      GUIDELINES AND CRITERIA
                        FOR CONGRESSIONAL AND
19                      LEGISLATIVE REDISTRICTING
20      EXHIBIT 7       2021 REDISTRICTING       69        14
                        GUIDELINES SOUTH
21                      CAROLINA SENATE JUDICIARY
                        COMMITTEE REDISTRICTING
22                      SUBCOMMITTEE
23      EXHIBIT 8       REBUTTAL REPORT OF SEAN 173        13
                        P. TRENDE
24
25
```

Page 190

1      1  Adriel Cepeda

2      2  acepedaderieux@aclu.org

3      3                              August 15, 2022

4      4  RE:    South Carolina State Conference Of The NAACP And Scott,

         Taiwan v. Mcmaster, Henry, Et Al.

5      5      8/8/2022, Kosuke Imai, PhD (#5350506)

6      6      The above-referenced transcript is available for

7      7  review.

8      8      Within the applicable timeframe, the witness should

9      9  read the testimony to verify its accuracy. If there are

10    10  any changes, the witness should note those with the

11    11  reason, on the attached Errata Sheet.

12    12      The witness should sign the Acknowledgment of

13    13  Deponent and Errata and return to the deposing attorney.

14    14  Copies should be sent to all counsel, and to Veritext at

15    15  cs-southeast@veritext.com

16    16

17    17   Return completed errata within 30 days from

18    18 receipt of testimony.

19    19    If the witness fails to do so within the time

20    20 allotted, the transcript may be used as if signed.

21    21

22    22                  Yours,

23    23                  Veritext Legal Solutions

24    24

25    25

Page 191

1    1  South Carolina State Conference Of The NAACP And Scott, Taiwan v.

Mcmaster, Henry, Et Al.

2    2  Kosuke Imai, PhD (#5350506)

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20   0  _____

21   1  REASON_____

22   2

23   3  _____     _____

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25   5

Page 192

1    1  South Carolina State Conference Of The NAACP And Scott, Taiwan v.

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The South Carolina State Confvs.McMaster/Alexander

**[& - 22]**                                                        Page 1

**&**

**&**   3:9,14

**0**

**0**   191:10,20
192:10,20
**0.1**   74:8,15
**0.4**   89:8
**0.45**   138:15
**0.5**   138:16
**03302**   1:6

**1**

**1**   9:20 38:21
40:25 64:11,15
71:20 84:23
88:19,24 89:6
94:8 95:25
103:10 107:7
110:23,25 113:7
113:24 114:5,12
116:11,13,17,22
117:5,12 118:13
118:25 119:5,19
120:14,19 122:4
122:7 123:21
124:5 127:6,11
128:1,10 129:2
129:18 130:2
133:4,6,21,25
134:8 136:2,4,16
141:19 146:3,10
146:16 147:5,19
147:19 148:8
149:1,16 151:16
152:9,12 154:6
154:14,23 155:7
155:14,17 156:4
156:18,19 157:7

157:9,17,20
163:21 188:4,12
189:4 190:1
191:1,11,21
192:1,11,21
**1's**   123:10 129:9
**1.07**   81:15,15
97:10
**1.2**   81:16
**1.29**   129:24
**1.3**   129:15,22
130:3,4,8
**1.35**   81:16
**10**   70:15 88:8
97:18 130:14,15
130:16,24 133:2
190:10
**10,000**   92:23,25
93:25 94:4 95:4
98:12 139:13,19
140:10,14,18
142:19 143:2,10
173:4
**100**   12:18 27:15
45:21 115:12
116:1 117:6
166:23
**10006**   2:16
**104**   3:5
**11**   97:18 114:2
132:14 190:11
**11:04**   1:13
**12**   89:21 90:3,5
94:7 114:12
120:18 121:7,11
190:12
**1221**   3:11,16

**13**   25:19,23,25
26:1,4 94:22,23
120:10,12,19
127:3 189:23
190:13
**14**   26:22 27:11
28:16 106:23
107:4 127:14
189:20 190:14
**15**   127:14 145:18
145:21 163:18
190:3,15
**16**   188:10 189:7
189:16 190:16
**17**   32:21,23
151:10 190:17
**17.4**   121:2
**173**   189:23
**1730**   2:5,10
**177**   188:8
**18**   157:24 164:2
190:18
**1800**   2:5,10 3:11
3:16
**182**   188:10
**187**   188:12
**19**   159:3,24
164:2 189:9
190:19
**1998**   19:10

**2**

**2**   16:9 38:20
101:9 114:8,8
120:11,12,13
122:17,25
127:23,25 158:4
158:13,19

159:13 160:6,10
160:16,18,20
161:7,15,17
162:2 163:10
164:6,10 166:25
167:8 168:18,23
176:5 187:25
189:7 190:2
191:2,12,22
192:2,12,22
**2's**   164:17
**20**   70:10,17 74:7
77:16,21 89:24
106:20 109:13
109:18 189:4
190:20 192:15
**20001**   2:21
**2002**   19:12
**2003**   19:13
**20036**   2:6,11
**2010**   19:20 51:16
52:10 53:8,19,25
**202**   2:6,11,22
**2020**   50:24 51:15
53:1,11 54:2
110:24
**2021**   68:18 69:14
189:17,20
**2022**   1:12 16:10
18:17 19:3
174:7 187:11
189:8,9 190:3
**2027**   187:25
**21**   190:21
**212**   2:16
**21903**   187:22
**22**   70:14,17 74:7
77:16,21 106:20

**[22 - 6]**                                                     Page 2

109:13,19
190:22
**22nd**   184:25
185:25
**23**   88:6 188:8
190:23
**23.9**   162:10,14
163:6,15
**2388**   162:17
**24**   165:25 166:2
167:5 190:24
**24,900**   129:3
**25**   78:18,21
84:22 89:2
138:6,7,8 190:25
**26**   59:14 62:9
130:11 138:2
**26.9**   165:12
**26b**   48:7
**27**   94:23 106:24
108:2 114:11
**28**   120:15
**282-1195**   3:6
**29**   119:3 121:1
**29.4**   121:7
**29201**   3:11,16
**29601**   3:5

**3**

**3**   19:3 43:4
114:9 127:18
128:12,13,14,15
171:21,24
172:12,15 188:6
189:9,9,11 190:3
191:3,13,23
192:3,13,23

**30**   120:15,17,18
120:18 190:17
**31**   17:13,15
**32**   129:1
**33.9**   166:24
**34**   189:11
**35**   145:22 147:4
**36**   150:19
**37**   154:8
**39.4**   159:5 162:6
166:3
**3:21**   1:6

**4**

**4**   16:10 29:12,14
30:18 34:3
114:9 128:12
163:18 188:4,6
189:8,11 190:4
191:4,14,24
192:4,14,24
**4.5**   147:6
**40**   2:15 159:1
161:1,1 162:6
165:9,25 166:22
**41**   65:21 66:3
162:10,15
**41.1**   120:4
**43**   169:21
**45**   41:20 135:15
136:20,23
137:12 139:18
140:1 164:8
171:16 172:18
172:22 173:1
183:24 184:4
**450**   14:20

**457-0800**   2:6,11
**46**   137:5
**46.9**   172:6
**49.9**   172:11
**4:32**   186:14
**4th**   174:4,5

**5**

**5**   30:18 65:9
114:8,9 123:2,4
146:6,8 169:11
170:3 176:6,16
189:14 190:5
191:5,15,25
192:5,15,25
**5.8**   119:6,10,18
120:2 121:24
**50**   41:21 115:16
116:3 135:16
136:20,24
137:12 139:21
140:2 164:8
167:4 171:16,20
172:18,23
183:24 184:5
**500**   115:7,12
**51**   2:21
**5350506**   190:5
191:2 192:2
**57**   78:20 80:7,22
84:22 89:2 97:7
106:17 138:3,8,9
**5th**   2:15

**6**

**6**   25:20 26:3
41:19,22,25 42:4
43:2 64:11,15
68:16 84:23

89:7 94:8 95:25
103:10 113:7,24
114:5 118:25
119:24 120:8
121:19,22 122:4
122:8,11,17,25
123:2,4,15,21
124:5 127:6,11
130:3 133:4,6,21
133:25 134:2,8
135:15,20 136:2
136:5,8,13,17,24
137:9 138:25
139:9,15 140:1
141:14,21,24
142:9 146:3
147:23 148:2,3,4
148:6 149:1,16
150:22 151:10
151:12,14 152:4
152:9,15,19,23
153:1,20,23,25
156:4,18,19
157:8,9,13,17,20
158:4,13,19
159:8,18 160:10
160:20,22,23
161:2,4,9,10,15
161:18,21 162:2
163:10,22 164:6
164:7 165:14
167:3 168:8,10
168:18,23
169:11,25
170:12,24 171:3
171:12,14,15,24
172:5,16,24
173:1 184:4

**[6 - al]**

189:16 190:6 191:6,16 192:6 192:16

**6's** 120:3 121:10 121:14 123:9 136:19 138:15 141:8,17 171:19 183:23

**6.5** 147:6,13

**61** 108:2

**65** 189:14

**68** 189:16

**69** 189:20

**6s** 121:20

**7**

**7** 32:21 69:14 114:9 147:24 148:4 153:21 158:11 189:20 190:7 191:7,17 192:7,17

**730** 71:22

**731,204** 72:25

**74,600** 154:11

**76.3** 154:13

**799-9800** 3:12 3:17

**8**

**8** 1:12 70:12 109:17 159:24 160:1,24 161:22 162:13 163:9 167:6 173:13 176:17,24 189:23 190:8 191:8,18 192:8 192:18

**8/8/2022** 190:5

**803** 3:12,17

**864** 3:6

**879-3939** 2:22

**8th** 187:11

**9**

**9** 70:15 189:4,7 189:14 190:9 191:9,19 192:9 192:19

**90** 117:13 170:24

**90.3** 169:23

**900** 3:5

**9500** 129:5,8

**965-2200** 2:16

**a**

**a.m.** 1:13

**ability** 122:12

**able** 47:9 124:8

**abstract** 34:22 36:7 38:9,22 43:7 44:22

**academic** 16:1 22:22 132:1

**accepted** 22:23 23:2,5

**access** 18:3 47:5 64:2

**account** 100:13 101:25 102:13 102:15,18 122:1 136:21

**accounted** 181:23

**accounting** 161:22 167:4

**accounts** 131:22

**accuracy** 39:8 175:6 190:9

**accurate** 187:5

**accurately** 36:13

**acepedaderieux** 2:7 190:2

**achieve** 73:1

**acknowledged** 40:9

**acknowledge...** 192:3

**acknowledgm...** 190:12

**aclu** 3:21 14:3,6 14:9 45:6,21

**aclu.org** 2:7,12 190:2

**act** 137:13

**actual** 43:18 51:10 137:8

**ad** 68:18 189:17

**adams** 28:21

**add** 49:6 107:15 135:11,23

**added** 110:13,18

**addition** 12:11 33:21

**additional** 54:15 73:25 101:11 103:1 135:11 153:21 180:13 182:11 185:20

**additions** 192:6

**address** 22:25 26:15 112:12 113:17

**addresses** 30:12

**adjacent** 23:23 24:3 79:10

**adjusting** 76:20

**administrative** 31:9 102:15 105:3

**admission** 143:1 143:5

**adriel** 2:4 47:3 190:1

**advised** 186:15

**affect** 58:14,17 76:16 133:11 171:13

**affixed** 187:10

**age** 114:18,19,21 114:23 115:8 151:15 160:5,8 160:17,18 170:20

**aggregate** 20:11

**ago** 27:3 45:17 123:8 173:24 174:9

**agree** 36:20,22 66:11,16 67:1 72:1 84:3 115:6 129:20 139:25

**agreement** 5:22 14:23

**ahead** 5:16 49:13,21 56:1 62:20 65:7 113:11

**al** 1:4,7 2:3 190:4 191:1 192:1

**[alabama - appropriate]**                                    Page 4

**alabama** 14:14
  28:11
**alexander** 1:7
  4:13
**algorithm** 13:18
  21:9,24 22:2
  23:10,11,20,22
  24:5,18 33:5,6,7
  33:8,11,16,25
  37:5,7,24 38:6
  38:14,15 39:19
  41:6,13,13,22,23
  42:4,6,8,12,24
  45:10 49:15
  50:14 51:1 55:8
  56:8 58:7 70:22
  71:2 75:5,8
  78:10,13,16 79:9
  80:14,19 81:20
  82:7 83:23 93:1
  93:6,14 95:2,18
  95:20 96:11
  98:3,6 101:25
  102:8,19 103:4,7
  106:15 110:13
  110:14,18,23
  132:13,16
**algorithms** 20:1
  20:7 23:13,15,16
  24:16 33:10
  37:18 38:2,16,18
  38:25 39:2,5,9
  39:17 40:9,16
  43:15,17,22 44:4
  44:8,13,17
**allotted** 190:20
**allows** 88:12
  136:13

**altered** 114:5
**amathias** 3:6
**amend** 17:1
**amended** 9:21
  189:4
**american** 2:4,9
**analyses** 22:9,14
  22:17 48:18,19
  64:10 104:13,13
  157:1,14
**analysis** 11:20
  12:4,6,13,17,24
  17:9 21:16 22:5
  22:8,18 26:17
  30:11,12 31:25
  36:20 38:13,18
  40:5 41:15 42:6
  47:23 48:3,9,16
  48:23 49:2,3,8
  49:17,25 51:13
  52:19 53:24
  54:11,23,25
  55:11 56:4
  58:17,17,22
  59:16 60:4 61:6
  61:20 62:1,6,11
  62:14,18 63:16
  67:10,23 68:1
  76:17 81:1 86:8
  86:16,18,19
  91:24 96:5,8
  98:1 102:13
  103:17,20
  104:12,15
  112:12 113:3,19
  113:21,21
  118:11,12,15,19
  122:14 123:11

  123:12,15,22
  125:14 127:20
  130:5,8,10
  133:23 134:13
  135:5 136:6,10
  136:15,22
  138:23 139:3
  140:21 141:7,15
  141:16,18
  142:23 145:1
  146:6,25 155:10
  155:23 156:1,3,8
  156:16,17,19,25
  157:1,2,4,10,15
  164:20 166:21
  167:15,16 169:8
  170:6 174:14,18
  175:7 176:20
  180:20 181:6,9
  184:9,11
**analyze** 32:4,7
  41:16 67:21
  76:10 122:10,11
  155:6,11 159:17
  168:22 170:11
  171:2 182:6,22
**analyzed** 112:7
  119:24 133:22
  176:11,14 177:1
**analyzes** 29:15
**analyzing** 85:6
  145:24
**andrew** 3:4
  177:13,18
  184:15
**announcement**
  10:8

**answer** 5:15,16
  5:24 6:6 13:6
  47:6 49:13,21
  51:20 52:3,15
  53:22 54:1,9,21
  55:21 56:1 57:4
  59:18 62:25
  124:8
**answered** 166:7
  180:2
**answers** 5:4
**apart** 7:18
**appearances** 2:1
  2:25 3:1
**appeared** 27:12
**appearing** 4:18
**appears** 24:21
  107:10 131:6
  158:14
**appended** 192:7
**applicable** 190:8
**application** 20:7
  35:13 36:10
  40:6,11,13 43:24
**applications**
  21:11 22:2 40:4
  40:11
**applies** 38:17
**apply** 39:21
**applying** 43:17
**apportionment**
  28:8 73:15
**appreciate** 93:22
  126:7
**approach** 40:16
**appropriate**
  75:1

**[approximate - basically]**                                    Page 5

| | | | |
|---|---|---|---|
| **approximate** 83:10 | 84:13 136:19,22 | **available** 104:6 | 25:15,16 27:5 |
| **approximately** | **assess** 112:24 | 105:7 106:10 | 34:24 44:22 |
| 45:11 71:23 | **assign** 95:2 | 190:6 | 45:16 47:15 |
| 129:3 137:8 | 105:15,19,21 | **avenue** 2:21 | 70:5 72:13 74:5 |
| **april** 16:10 | 106:4 159:7 | **average** 74:23 | 77:15 88:5 89:1 |
| 17:21 27:5 | **assigned** 83:18 | 77:23,24 78:2 | 95:4,16 99:8 |
| 189:8 | 122:8 128:10 | 92:16,18,19,20 | 101:4 109:12,13 |
| **area** 31:1,16 | 148:7 151:16 | 92:24 93:8,15,19 | 138:2,10 145:17 |
| 88:3,15,23,23 | 152:12 154:13 | 94:1,21 95:10 | 163:17 164:2 |
| 123:25 126:1 | 160:6,11 161:2,6 | 97:13,17 98:13 | 167:17 |
| 148:9 149:10 | 161:14 166:25 | 98:15,18 99:1,2 | **background** |
| 150:9 | **assigns** 80:7 | 99:4 119:4,8,11 | 19:8 91:1 |
| **areas** 36:16,25 | **assist** 15:1,14,18 | 121:20,23 129:2 | **bagley** 9:11 |
| 104:21 124:4 | **assistants** 15:5,6 | 129:3 130:3,4 | **balanced** 34:4 |
| **article** 24:6 43:4 | **assume** 5:25 | 131:7,16 132:7 | 189:11 |
| 65:10,15,22 | **assuming** 73:25 | 133:3,5 147:5,13 | **baodong** 9:7 |
| 66:10 73:15 | **assumptions** | 160:19 173:3 | **bar** 151:17,22 |
| 189:15 | 12:21,23 13:2,7 | **averages** 95:5 | **bars** 90:10 |
| **articles** 10:25 | 13:10,13,15 | 98:11 133:4 | **base** 180:3 |
| 20:20 21:15,19 | 46:22 | **avoid** 73:24 75:5 | **based** 39:22 57:6 |
| 22:3,10 23:14 | **attached** 190:11 | 103:7 153:11 | 58:3,23 63:4 |
| **arts** 19:9,10 | **attempt** 54:16 | **avoidance** 79:24 | 71:11,12 74:17 |
| **asked** 11:2,5 | 174:21,24 | 81:9 84:24 | 91:24 96:16 |
| 22:24 48:15 | **attempted** | 85:21 89:7 | 99:24,25 100:17 |
| 49:22 53:7 | 182:21 | 106:8 | 100:20,25 |
| 54:22 174:19 | **attention** 174:12 | **avoiding** 73:23 | 107:16 179:23 |
| 179:11 181:11 | **attentiveness** | **aware** 19:17 | **baseline** 111:10 |
| **asking** 22:17 | 177:11 | 117:21 133:20 | 111:15 113:3,4 |
| 48:12 59:13,15 | **attorney** 55:19 | 134:7 136:18 | **basic** 35:14 |
| 59:16 62:10,11 | 190:13 | 158:18 | 131:21 |
| 90:25 91:1 | **attorneys** 2:2,18 | **b** | **basically** 20:10 |
| 142:5 166:6 | 3:2,8 | **b** 10:17 11:3 | 23:21,23 24:7,12 |
| **asks** 62:8 | **august** 1:12 | 72:21 103:2 | 35:17 40:22 |
| **aspect** 112:7 | 187:11 190:3 | 189:1 | 42:23 55:1 61:6 |
| **aspects** 132:12 | **automated** 76:7 | **bachelor** 19:9 | 61:19 78:12 |
| **assembly** 83:11 | **automatically** | **back** 17:21 | 79:5,13 80:1,17 |
| 83:18,23,24 84:8 | 40:12 75:13 | 19:16 24:25 | 82:12 93:5 |
| | 136:16 141:20 | | 108:14 123:21 |

Kosuke Imai, PhD                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

**[basically - bvap]**                                    Page 6

139:7 141:10
142:14 166:20
166:23 181:6
**basis** 29:25
**bayesian** 26:18
**bear** 65:1
**begins** 154:10
**behalf** 27:25
177:16,19
**behavior** 20:11
**belabor** 166:8
**believe** 10:13
16:7 17:22
18:16 24:20
29:15 32:19,23
52:21 57:17
59:18 65:15,25
66:10 68:6
92:15 106:19
123:23 129:1
137:11 140:25
159:3 174:2
179:3 180:12
**ben** 45:2
**benchmark**
47:23 48:24
49:2,9,14,15,16
49:18,23,24 50:4
50:6 51:17,22,25
52:4,6 53:24
54:6,13,18 55:12
55:15 56:9,24
57:5,8,18,21,22
57:24 58:2,5,6,9
58:13,24 59:9,25
60:3,22,23 61:5
61:9,13,15,17,22
61:25 62:2,5

63:3,17 103:19
106:3 110:25
118:16,17,18
122:23 128:19
128:20,23,25
147:2,3 154:18
154:19,20 158:7
158:9 169:16
178:11 179:4
181:5
**benefit** 10:4
**berkeley** 117:2
146:20
**best** 33:24 94:8
**better** 37:25
38:5 41:23
89:13 107:7,11
131:7 132:24
**beyond** 141:7
142:16 165:24
**big** 18:15 117:23
**bigger** 104:14
**binder** 16:7 34:7
68:10 69:10
**bit** 8:11 13:21
32:18 39:7 42:3
70:3 90:17 97:6
132:23 144:9
175:21
**black** 31:11
49:10 114:17,18
114:21,23 115:8
118:20,21
119:11 122:3,6
122:12 123:15
123:17,18,25
124:3,7,22 125:5
125:17,21

127:21 128:8,23
129:3 148:4,13
148:14 149:1,16
149:23 150:1,6,7
150:9,22 151:6
151:15,25 152:1
152:8,11,14,16
152:16,21 153:1
153:25 154:5
160:4,7,17,17
164:23 165:4,15
165:19,21
166:10 167:2,7
167:22 168:5,10
168:13 170:19
**blank** 24:13 35:4
35:15 36:4 41:7
41:10 42:2,21
**blind** 40:19,21
40:24 41:1 42:8
61:6,10 103:11
118:22 119:5
**block** 75:14,23
76:3 77:1
**blocks** 74:21
75:24 76:1
**books** 10:24
20:20
**border** 116:24
116:25,25
**boundaries** 24:7
30:14 31:9
40:22 55:2
73:22 75:11
76:11 102:15
105:3 106:12
113:1,6 114:8
127:6 131:3

142:3 156:20
157:17 180:23
**boundary** 39:10
61:11,13 79:13
114:5 122:21
123:6 127:10
136:1 145:25
146:2 149:9
158:19 168:23
**break** 6:2,4,7
70:9 77:13,16
135:2 177:8
**breaks** 6:4
**brief** 8:21
**briefly** 8:22 19:7
88:6
**bring** 47:1
**broad** 23:16
**broadly** 23:21
166:8
**browser** 18:8
**bucket** 98:12,13
**buffering** 24:21
**build** 42:21
**building** 35:16
36:4
**bullets** 77:20
**burchstead** 3:10
**burden** 73:25
**burr** 3:9,14
**burr.com** 3:12
3:17
**bvap** 41:20 42:4
42:25 114:14
115:3,12,16,19
116:1,3,6 119:4
119:19,21,25
120:3,7,14

**[bvap - certainly]**                                                Page 7

121:10,14,14,19
122:11 123:9,10
127:17,21 128:2
128:15,16 129:9
130:2,9 135:15
136:3,4,8,13,15
136:17,19,24
137:8,12 138:15
138:25 139:8,15
140:1 141:8,14
141:17,19,20,24
142:9 146:15
147:5 157:12
161:4,6,8,14,15
163:10,10,22,25
164:7,10,17
165:13 166:20
166:25 168:8
170:16,17 171:4
171:4,5,13,14,16
171:19,21 172:6
172:12,23,25
173:3 183:23
184:5

**c**

**c** 1:7 10:17 11:3
**calculated** 94:21
**calculating**
92:16 97:16
**calculation**
100:1,25
**calculations**
175:3
**call** 31:6,13
**called** 24:6,11
37:11 65:15
175:16

**calling** 55:19
**calls** 48:5
**cambridge** 1:14
6:17
**candidates**
122:13
**cap** 14:21,23,24
**career** 20:18
**careful** 60:15
**carlo** 23:15,19
23:22 24:12,17
33:7 34:4 35:1
35:10,11,15,19
35:24 37:3,4,12
38:1,6,10 50:3,8
189:11
**carolina** 1:1,3
2:2 4:16 6:14
8:1 14:16 20:13
28:13,13 29:16
31:4 46:10 68:7
68:16 69:3,15
96:16 108:15
112:6 180:4
187:4,12 189:16
189:21 190:4
191:1 192:1
**carries** 30:18
70:15
**carry** 181:7
**case** 1:6 4:16,18
6:12,15 8:6,24
9:3 11:2,15
13:21,23 14:7,14
14:15,16,19,22
17:5 22:6,18
24:17 26:8 27:4
27:6,7,9,10,13

27:14,15,16 28:1
28:3,5,5,11,12
28:14,14,20,21
28:22 29:8 33:9
39:20,23 40:7,14
40:14 41:17,18
44:1 45:23,24
46:5,22 53:17
63:6 72:25 76:9
79:6 80:24,24
84:14 102:12
103:10 108:15
111:8 113:6
119:23 141:23
148:2 161:3
162:8,9 164:14
166:24 174:14
178:2 184:9
**cases** 14:8,12
26:25 27:11,18
27:19,20,21,23
28:9,10,15,16
38:12 41:9
43:14 44:13,16
44:17 82:2,3
84:6,7 93:17
98:22 111:5
161:5 165:12
166:22
**category** 162:22
163:4
**cause** 187:8
**caveat** 107:15
**cc'd** 11:7
**census** 12:9
26:11 50:24
51:16 52:10
53:1,8,9,10,19

54:1,3 74:21
75:14,23,24 76:1
76:3 77:1
**cepeda** 2:4 5:11
5:12 6:23,24 7:1
7:18 13:4,25
25:8,12 46:7
47:5,11 48:4,12
48:20 49:11,19
51:18 52:1,13
53:20 54:7,19
55:18,22 57:2,20
59:12 60:6 62:7
62:13,21 63:10
137:17 141:4
143:6 148:17
149:3,6 165:6,22
171:23 177:21
177:24 179:2
182:14 184:14
184:21 185:9,11
185:15,19,22
186:1 188:8
190:1
**certain** 12:18
24:8 31:16 37:9
38:14,15 42:25
44:13 60:17
78:14 79:21
80:8,8,15 81:2
84:9 97:1
123:25 124:4,7
126:1 136:9
138:21 149:24
154:25 157:13
164:15 168:9,9
**certainly** 9:1
12:20 44:21

**[certainly - committee]**                                      Page 8

| | | | |
|---|---|---|---|
| 52:18 74:11 84:14 88:4 | **charge** 14:20 | **choice** 80:24 | **close** 120:17,18 |
| **certificate** 187:1 | **charging** 14:18 | 122:13 | 167:1 172:23 |
| 188:12 | **charleston** 41:1 | **choose** 23:23 | **closely** 98:2,7 |
| **certify** 187:4,7 | 61:11 64:15 | 80:22 81:1,5,15 | 132:15 |
| **cetera** 15:17 | 81:13 96:3,4 | 83:1 93:5,16 | **closer** 172:25 |
| **chain** 23:22 33:7 | 97:9 103:12 | 95:8 97:24 | 173:1 |
| 35:6,10,19,24 | 107:11,17 | 180:18 | **clyburn's** 135:19 |
| 37:3,4 38:1,6 | 117:11,11,11,17 | **choosing** 138:24 | **collaborated** |
| 50:3,8 | 117:17,23,24 | 138:25 | 45:12 |
| **chains** 65:10,16 | 118:6,8 119:14 | **chose** 137:7 | **collaborator** |
| 189:14 | 119:17 123:19 | **circuit** 26:6 | 45:8 |
| **chairman** 4:14 | 123:19 124:10 | **citation** 39:2 | **collect** 10:22 |
| **chance** 182:9 | 124:13,15,19 | 43:16 | **colleton** 134:18 |
| **chances** 118:3 | 125:8,18,19 | **citizens** 176:25 | 156:10 157:19 |
| 181:24 | 126:12,17 127:1 | **city** 27:8 117:11 | **colloquialism** |
| **change** 76:21 | 127:7,11,17 | 117:17,23 118:5 | 143:8 |
| 82:16,19,20 83:2 | 128:3,6,9,15 | 119:14,16 | **color** 116:19 |
| 83:4 84:14 | 130:23 131:3,8 | 123:19 124:13 | **colored** 116:12 |
| 104:12 122:21 | 133:2,19 134:6 | 124:15,18 | 146:9 |
| 123:5,9,10 130:8 | 145:25 146:21 | 125:18 126:12 | **columbia** 1:2 |
| 136:11 191:4,7 | 146:22 147:17 | 146:21 147:16 | 3:11,16 |
| 191:10,13,16,19 | 147:17 148:8 | 151:1 | **come** 54:2 84:10 |
| **changed** 27:17 | 149:19,19 | **civil** 2:4,9 | 153:4 172:3 |
| 82:23 83:24 | 150:20 151:2,4,5 | **clarification** | **comes** 33:19 |
| **changes** 155:11 | 151:16 152:2,16 | 46:2 50:23 86:9 | 50:21 |
| 155:20 190:10 | 152:18,22 153:1 | 111:17 | **comfortable** |
| 192:6 | 153:14 154:1,3,5 | **clarify** 5:22 32:9 | 47:9 |
| **changing** 82:15 | 154:17,22 155:3 | 50:5 78:8 92:7 | **coming** 119:11 |
| 82:18 148:25 | 155:7,13,16,17 | 131:24 140:4 | 119:12,13 |
| **characteristics** | 156:5,21 157:6,6 | **class** 19:16 23:16 | 147:13,23,24 |
| 59:3 76:8 | 163:22 183:16 | **classes** 19:15 | 151:25 157:16 |
| **characterization** | **chart** 116:12 | **clause** 73:15 | **comment** 150:13 |
| 132:25 | 146:9 | **cleanly** 175:21 | 155:2 170:8 |
| **characterize** | **check** 11:11 | **clear** 13:19 | **commission** 3:8 |
| 89:16 131:10,20 | 106:16,21 | 22:19 111:25 | 28:8 177:16 |
| 132:20 | **checked** 11:9 | 126:3 133:1 | 187:24 |
| | 153:5 | 175:14 | **committee** 4:14 |
| | | | 68:17,18 69:4,16 |

69:24 189:17,17 189:21

**commonly** 97:25

**communicate** 101:21 102:4

**communication** 55:19

**communities** 101:18 102:1,14 104:22 105:1,7 105:10,14,16,18 148:14 149:1,24 167:23 168:1,6 168:15

**community** 102:7 125:17,21 150:6,7,10 165:21 166:10 166:15,16,17 167:25 168:3

**compact** 34:4 73:21 77:23 81:22 82:1,3,5,8 97:14 98:13 130:21 189:12

**compactness** 80:9 81:14 82:13 97:4,7,19 97:22 98:3,9,17 98:23,24 99:2,5 99:17,22,24 100:5,10,24 101:14,17 102:23 130:17 132:10 139:4

**comparable** 88:13 100:11

**comparator** 66:3 66:4

**compare** 50:19 51:6,24 52:4,11 52:20 59:10 63:20,25 64:3 85:25 88:12 100:15 111:10 120:8 144:20

**compared** 53:4 82:6 95:10 120:1 122:23 129:5 161:15 165:7

**compares** 121:14

**comparing** 63:8 86:7 100:17 113:4

**comparison** 63:12 98:20,24 136:14 150:23

**complaints** 21:9 21:9,10

**complete** 26:25 187:6 192:8

**completed** 190:17

**completely** 58:18

**complex** 39:7

**compliance** 84:3

**complies** 137:12 184:5

**comply** 67:2

**components** 20:6

**compromise** 140:22,23

**computational** 21:21

**conceptual** 172:10

**conceptually** 125:16

**concerns** 151:1

**conclude** 30:7

**concluded** 186:14

**conclusion** 30:15 66:6 141:5 142:14

**conclusions** 30:2 58:10 67:24 76:16

**condition** 91:14

**conduct** 31:25 51:15 113:2 134:12 144:25 184:10

**conducted** 15:23 40:20 62:14 112:16 157:15 184:8

**conference** 1:3 2:2 9:21 189:5 190:4 191:1 192:1

**configuration** 99:23 100:5

**confirm** 109:21

**confirmed** 11:11

**confirming** 65:21

**confused** 128:11 175:12,20

**congressional** 4:15 14:14,15 16:20 27:15 28:12 29:16 46:10 63:23 68:19 72:22,24 73:14,17 74:1 90:21 178:2,5 189:18

**congressman** 135:19

**connection** 4:18 10:21

**consider** 32:11 32:15 40:6 51:1 56:19 71:3 89:10 103:4 109:25 110:3,9 110:11,13 117:25 118:2 144:4 170:5,7

**consideration** 73:3 100:13 101:17 102:18 113:19 136:9 182:11,12 184:1

**considerations** 101:12 103:1

**considered** 136:6 144:9 159:16 183:2,7

**considering** 136:12

**consistency** 42:7 103:2

Kosuke Imai, PhD

August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[consistent - correct]**

Page 10

| | | | |
|---|---|---|---|
| **consistent** 117:19 | 135:5,12,24 136:24 138:11 138:14,16,21 139:1,2,4,10,11 139:12 140:24 142:1,11,13,15 142:16,18,19,22 143:1,15,23 157:12 168:5 180:13 | **contained** 16:24 25:11 | **core** 104:1,4 106:6,9 176:6,7 176:12 180:10 180:18 |
| **constituency** 104:4 | | **contains** 159:24 | |
| **constituent** 103:2 | | **contaminate** 54:25 | **cores** 54:17 103:3,5,14,21 |
| **constituents** 101:21 102:4 104:1 106:6,9 | | **contest** 73:23 | **correct** 18:17,18 26:20 28:24 29:17,18 30:4 33:2 35:2,7,8 36:19 44:14,15 50:11 51:2,4,5,7 52:22 56:12,13 56:16,17 59:22 60:2 63:18,19 64:11,16,20,21 68:4,9 70:20 71:16,21 73:5 74:3,4,8,13,14 75:20 82:18 83:6,8 86:11,12 87:21,22 88:20 89:9 92:4 94:3 94:22 99:3,6 100:18,21 101:1 102:23 103:22 104:1,11,19,20 105:10,11,16,23 105:24 106:6 107:9,14,24 109:23 110:10 111:21 112:21 113:9,10,12 114:7,16,20 115:3 116:9,20 117:9 119:1,2,22 121:15,21 122:2 122:5,17 123:12 |
| | | **context** 86:7 | |
| | | **contiguity** 56:15 57:13 71:3,6,15 77:18 | |
| **constitute** 31:4 | | | |
| **constitution** 73:16 | **constraints** 13:18 33:10,11 36:12,21 37:10 39:4,13 42:15,23 50:18,25 53:3 55:9,12 56:8,11 56:14,24 57:25 59:10 60:23 67:10,14,17,18 78:6,11,24 79:23 80:8,17 82:24 83:5,7,9,10,13 83:19,25 84:1,18 86:14 89:3 91:13 93:17 96:15 103:14 132:8 143:17,19 180:4 | **contiguous** 70:19,23 71:9,14 153:15 | |
| **constrain** 95:18 | | | |
| **constrained** 153:9 164:8,10 | | **continued** 2:25 3:1 | |
| **constraint** 41:19 43:1 49:6 54:15 54:16 57:25 58:7 60:1,4,5 61:18 62:5 63:2 63:18 74:8,16 78:15 79:1,2,3,4 79:16,19,20,24 80:3,5,12,13,14 80:23 81:5,6,14 81:24 82:11,16 83:1 84:24 85:11,12,17,21 85:22,22 86:22 86:23 89:8,11,17 93:5 95:2 97:8 97:20 103:21,25 104:3,25 105:9 105:19 106:14 106:22 110:14 110:18 111:4,20 112:20,23 113:9 113:15,22 127:5 | | **control** 54:17 55:14 60:22 118:15,20 128:19,22 147:1 163:11 | |
| | | **controlled** 56:18 | |
| | | **controls** 61:2 80:20 98:4,7 132:13 | |
| | | **convenient** 81:19 | |
| | | **conversation** 7:7 46:3,6 | |
| | **construct** 55:8,8 | **conversations** 6:23,25 7:4,9,14 12:24 13:9 46:8 | |
| | **construction** 136:16 171:11 | | |
| | **constructive** 37:12 | **cool** 116:12 146:9 | |
| | **contacted** 13:22 14:1 | **copied** 46:15,18 | |
| | | **copies** 190:14 | |
| | **contain** 16:19 59:25 | **copy** 7:23,23 8:2 8:3 17:16 185:18 | |

Kosuke Imai, PhD                                           August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[correct - cracks]**                                        Page 11

123:16 124:5,23
127:12,13 128:1
128:20,24 129:7
130:6,19,21,22
134:16 135:9,10
135:12,13,16
137:10 140:11
140:19,20,22,24
142:10 143:11
143:12 145:25
146:3,12,18
147:2 148:6,16
149:20,24 150:4
150:7,24 151:2,7
151:22,23
152:10 153:2,10
154:16,23 155:4
155:21,22
158:15 159:10
159:14 160:20
161:18,19 162:3
166:11 167:9
169:12,13,25
170:1,4 171:18
171:22 172:13
172:16,17
174:15 175:9
176:13 178:17
179:6,10 182:23
182:24 183:3
184:9,25 192:8
**corrections**
192:6
**correctly**   7:7
36:18 38:3
39:14 43:19
44:11 66:8 73:4
88:16 100:2

101:2,23 108:9
116:10 117:1
138:18 147:10
154:15 159:9
**correlated**   112:5
**correspond**
67:14
**corresponding**
77:25 78:3
98:14 147:8
160:23
**corresponds**
75:2
**cost**   185:20
**council**   27:8
**counsel**   1:15 2:1
5:7 8:1,4 10:4
11:3,5,6,11,15
11:22,25 12:8,14
12:21 13:2
18:20 46:4,14,18
49:22 54:22
55:13 56:3 69:8
70:1 173:21,22
174:9 179:8
187:8 190:14
**count**   20:25 21:1
**counties**   77:24
79:4,14 89:5
91:20 92:6,11
95:19,21,23 96:1
96:11,18 102:16
105:4 133:20,24
134:7,13 157:22
165:10 168:18
168:21 183:19
**counting**   92:17

**county**   31:3,4,6
41:1 61:11 79:5
79:12 81:13
89:7,19,20,23
90:1,14,20 91:12
91:17 92:2,14,16
92:24 93:2,7,8
93:12,13,15,17
93:18 94:1 95:5
95:17 96:3,4,7
96:21 97:9
103:12 107:11
107:17 117:2,12
117:18,24 118:9
127:1,7,11,17
128:3,7,9,15
130:23 131:4,8
133:2,19 134:2,6
134:16,18,20
139:4 145:25
146:22 148:9
150:20 151:5,16
152:2,16,18,22
153:1 154:2,3,5
154:13,17,22
155:4,7,16,17
156:5,8,10,12,15
156:21 157:6
158:2,7,14,16,20
159:6,7,12,18
160:5,11,18
161:2,6,8,9,17
162:2 164:2,15
164:24 165:5,16
165:20,21
166:20 167:17
168:12,24 169:9
170:3,12,16,20

170:24 171:3
187:12
**couple**   7:8 34:20
37:21 44:2
74:23 78:23
95:13 127:15
182:18
**course**   6:2 12:25
73:22 81:9
105:22 117:4
124:20
**court**   1:1,16 4:20
5:2 10:4 28:4
29:9 184:19,23
185:3,8,13,17,21
185:24 186:3,6
186:10,13
**cover**   88:2,14
104:9
**covered**   88:22
181:19
**crack**   124:22
125:5 148:13
149:23 150:5
151:7 165:4
166:3 167:22
**cracked**   125:24
149:2 150:2
**cracking**   30:21
30:23 31:5,6,7
31:10,13,14,19
31:24 49:10
123:24 125:9
148:23 149:13
165:1,15 166:9,9
166:13,19
**cracks**   30:20
123:15,20

**[cracks - describe]**                                              Page 12

124:12 125:7,21
149:16 150:10
164:23 165:19
**create** 57:7
113:2 152:20
**created** 58:3
83:16
**creating** 24:13
**criteria** 30:8
32:25 68:8,12,19
70:18 72:14,16
81:2 83:15
91:13 97:3
140:11 180:11
181:1 182:13
189:18
**criterion** 135:11
135:14,23
140:14 141:2
143:10
**criticism** 21:10
21:11,11,23
22:25 39:16,18
39:21 40:3
**criticisms** 21:18
22:1 40:15
**criticizing** 40:5
**cross** 11:11
**crum** 3:15
177:13,15,15
186:4,5
**cs** 190:15
**curious** 92:19
131:25
**current** 17:19,19
18:23 75:8
**currently** 54:4

**curriculum** 19:4
189:9
**cusick** 2:14
**custom** 138:14
138:20,22
**cut** 85:15 108:19
179:5
**cv** 1:6 17:16,19
17:19,23 18:17
18:22,23,24
24:20 25:8,11,14
27:4

**d**

**d** 188:1
**d.c.** 2:21
**darker** 116:16
**data** 11:14,19,20
11:23,24 12:1,6
12:7,8,9,9,12,15
12:18,19 20:11
26:11 32:4
46:12,13,17,18
50:24 51:16,16
52:10 53:1,8,9
53:10,13,19 54:1
54:2,3 74:18
75:10 85:6 86:2
91:25 102:10,13
109:25 155:9
181:13
**date** 1:12 173:23
174:1,2 191:24
192:12
**dated** 16:10
189:7
**day** 2:19 4:12
6:5 187:11

192:15
**days** 190:17
**dc** 2:6,11
**debates** 43:13
**decade** 60:19
**decided** 17:11
**decision** 26:6
**decisions** 13:11
154:25
**declare** 192:4
**decrease** 120:7
136:4
**decreases** 136:17
**decreasing**
122:11
**deemed** 192:6
**default** 80:9
81:17,19,25 97:7
**defendant** 3:2,8
28:1,6
**defendant's** 9:20
16:9 19:3 34:3
65:9 68:16
69:14 173:13
189:3
**defendants** 1:9
1:15 2:18,18 3:2
3:8 4:13 177:17
177:19
**defendants'** 9:21
189:4
**defense** 2:14
14:3
**define** 30:23
**defined** 125:18
**definitely** 111:1
153:20 168:9

**definition** 30:25
31:2,5 71:11,11
71:12 104:4
105:6,18 106:10
123:14,24 124:6
124:9 125:9,22
148:23 149:13
165:1 166:9
**definitions**
105:13
**degree** 19:11
88:25 166:12,19
**demarked**
158:16
**democrat** 32:13
110:5,20
**demography**
101:18 102:1,7
**depending** 38:12
39:20 67:9
74:24 104:11
116:8 168:13
**depends** 85:6
96:8 102:6
123:17 167:25
**deponent** 188:11
190:13 192:3
**deposed** 6:10
**deposing** 190:13
**deposition** 1:11
6:21 7:19 8:13
9:22 10:9 25:10
77:12 135:1
177:8 186:14
189:5
**describe** 19:7
125:3

Kosuke Imai, PhD                                                    August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

**[described - district]**                                          Page 13

**described**   33:24
  142:8
**description**
  149:8
**design**   164:9
**designed**   83:15
**detail**   32:20
  139:23
**details**   185:12
**determinant**
  140:7
**determination**
  100:1 101:1
**determine**   68:3
  102:10 144:10
  144:15,21
**determining**
  30:14 101:16
  106:1 142:3
**developed**   23:13
  24:5 45:15
**developing**
  26:12
**development**
  20:7,9 45:15
  75:8
**deviation**   56:20
  71:19 72:2,19
  73:2,16,19 74:12
  75:2,6 76:14,15
  76:21 90:22
  91:9
**deviations**   74:2
  147:7
**diagnostics**
  33:22
**difference**   23:10
  35:14 42:9

76:20 119:4,8,9
120:6 129:2,4
131:19,23 132:4
132:24 133:11
141:11 151:19
151:21 156:21
**differences**
  22:14,16 35:9,12
  41:17 131:12
  133:17 157:16
**different**   23:3,12
  24:15,23 36:1,2
  37:17 38:12
  42:14 44:6,19
  49:5,6,6 57:25
  66:7 67:6,10
  76:19 78:23
  82:13 83:19,20
  83:25 84:10,16
  86:2,3,4,8 88:22
  88:23 95:20,23
  96:1,24 97:19
  98:5 104:10,17
  104:18,20,21
  111:11 114:23
  115:2,19 116:2,7
  116:8 131:12
  132:11,12
  142:13,23
  166:12
**difficult**   39:7,11
  42:3 75:7
**difficulties**   43:16
**direct**   105:9
  108:6
**directly**   13:8
  49:16 50:14,16
  51:11 55:8 56:7

58:6 61:18
75:22 93:13
98:3,7,7 100:7
100:14,14
103:18,23 104:3
105:19 180:14
**disagree**   62:21
  67:4
**disappoint**
  184:17
**disclosed**   13:13
**discourage**
  78:13 80:15
**discouragement**
  80:18
**discourages**
  79:21 80:5
**discovery**   62:17
**discriminates**
  29:24
**discuss**   22:4 46:4
  77:12 135:1
  158:1 166:18
  177:7
**discussed**   7:19
  12:23 13:8
  14:24 45:23
  46:1 52:25
  104:7 136:1,3
  148:15 165:18
  178:15 179:25
**discusses**   176:6
  176:17
**discussing**   77:16
  85:24 126:10
  163:20 170:15
**discussion**   156:5
  164:1 176:12

**display**   10:1
  65:14
**displaying**
  150:21
**disproportiona...**
  150:21
**dispute**   129:21
  175:3
**disqualified**   29:5
**distribution**   33:8
  33:13 36:14
  39:3 44:8 82:19
  82:20 125:11,14
  147:7 167:11
  168:14
**distributions**
  44:3
**district**   1:1,1
  24:9,14 30:14
  31:12 32:16
  35:16 36:5
  37:13,15 40:25
  41:8,19,22,25
  42:4,21,24 43:2
  54:18 58:11
  61:4,10 64:11
  75:11 76:11
  79:8,11 81:4
  84:23 86:1
  87:19,20,24 88:2
  88:3,12,13,19,19
  88:22,24 89:6
  90:21 91:19
  95:25 98:14,18
  98:21,24 99:4
  100:21 101:14
  101:17,20 102:2
  102:11 107:7

Kosuke Imai, PhD                                          August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[district - dr]**                                          Page 14

| | | | |
|---|---|---|---|
| 110:4,23,25 | 157:13,17,17,20 | 79:11 80:6 86:3 | **division**   1:2 |
| 113:24,24 114:5 | 158:4,4,13,13 | 88:14 91:4,18 | **divisions**   106:12 |
| 115:2,24 116:2,2 | 159:8,13,18 | 92:6,10 94:8 | **document**   9:16 |
| 116:13,17,22,25 | 160:6,12,16,16 | 96:6 97:13,22 |   10:5,7,10,13 |
| 117:5,12,16,23 | 160:18,22,23 | 98:13,19 103:3,5 |   16:15,17 18:19 |
| 118:16 119:5,19 | 161:2,4,7,9,10 | 103:9,10,15,21 |   34:11,13 38:20 |
| 119:22,24 120:3 | 161:15,15,21 | 104:1,7,9,17 |   68:24 69:1,5,7 |
| 120:8,14,19 | 163:10,10,21 | 105:22 106:1,6 |   69:20,22,25 |
| 121:10,14,19,20 | 164:1,5,6,6,7,10 | 110:19 113:7 |   173:20,21 |
| 121:22 122:4,4 | 164:17 165:10 | 114:8,22 115:18 | **documents**   7:21 |
| 122:11 123:6,9 | 165:14,20 | 115:19 118:25 |   8:8,12 10:21,22 |
| 123:10,15 | 166:11,23,25 | 119:22,24 |   70:3 |
| 124:16 128:1,7 | 167:3,8,24 168:8 | 121:18 122:7,9 | **doing**   74:22 |
| 128:10,19,23 | 168:10,22 | 122:17,25 123:2 |   122:7 |
| 129:2,9 130:2,3 | 169:25 170:3,12 | 123:4,21 124:1,4 | **dominates** |
| 131:2 134:2,8,8 | 170:24 171:3,7 | 126:2 127:6,11 |   143:23 |
| 135:15,18,19,20 | 171:12,14,15,19 | 130:9 132:12 | **dorchester** |
| 136:1,4,5,8,13 | 171:24 172:5,16 | 133:4,6,10,21,25 |   134:15 156:8,14 |
| 136:15,16,17,19 | 172:22,24 173:1 | 135:8 136:2,5,12 |   157:19 |
| 136:24 137:9,11 | 180:23 183:17 | 146:3 147:21 | **double**   106:16 |
| 138:15,24,25 | 183:21,23 184:4 | 149:16 153:4,21 |   106:21 |
| 139:9,15 140:1 | **district's**   115:3 | 154:7 155:20 | **dr**   4:5,11 6:10,16 |
| 141:8,14,17,19 |   171:4 | 157:7,9,20 |   9:7,11,13,15 |
| 141:21,24 142:3 | **districting**   30:8 | 158:19 160:10 |   10:5 11:14 |
| 142:9 145:25 |   57:18 | 160:20 161:16 |   13:20 16:4,14 |
| 146:2,10,16 | **districts**   23:23 | 161:17,25 162:2 |   17:13 18:10 |
| 147:1,5,19,19,23 |   23:24 24:3 31:2 | 162:19,21,23 |   19:7 25:18 |
| 147:24 148:2,3,4 |   32:12 36:12 | 166:15 168:18 |   28:25 34:1,11 |
| 148:4,6,8 149:1 |   37:14 39:10 | 168:23 169:11 |   36:17 40:15 |
| 149:1,8 150:22 |   40:23 41:2,6,10 | 171:6,22 172:3 |   43:3 47:22 |
| 151:9,16 152:4,9 |   41:16 42:1,10 | 172:16,19 |   48:17,22 56:1 |
| 152:9,10,12,15 |   55:3,16 56:19,19 | **diverse**   76:20 |   59:18 62:12,13 |
| 152:23 153:1,6,8 |   57:16 61:7,8 | **divide**   129:11 |   62:20,25 67:20 |
| 153:13,20,21,23 |   64:15 70:18,22 |   162:11 |   68:6,23 77:12 |
| 153:25 154:6,14 |   71:8,18 72:22,24 | **divided**   31:11 |   99:7 101:3 |
| 154:23 155:7,14 |   73:14,17,20,22 |   123:20 |   112:4 113:23 |
| 155:17 156:4,4 |   76:11 77:22 | **dividing**   96:20 |   135:1 173:20 |
| 156:18,19 |   78:17 79:6,8,10 | |   177:7,10,14,25 |

Kosuke Imai, PhD

August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[dr - enacted]**

Page 15

177:25 179:11 180:3 182:14,19 183:16 184:12 184:19

**draft** 12:25 13:9 21:15 22:3,10 39:25,25 43:4 44:25 46:6,9 47:24,25 48:6,13 48:15 51:21 54:10 55:10 59:14,16,19 62:8 62:11,14,16 63:11 169:3,5 178:10,15 185:5 185:10

**drafted** 178:1

**drafts** 179:5,7

**draw** 59:2 66:5 67:24 76:16 95:20

**drawer** 28:25 58:12,15,16,19 58:23,25 59:1,6 76:7 117:22 154:21,25 159:11,16 170:2 182:6,22 183:1,7 183:12

**drawer's** 117:25

**drawers** 83:16 170:6

**drawing** 29:3 58:10,11,13,15 76:11 91:18 112:25 113:6 180:23

**drawn** 137:11 142:6,10 172:15

**draws** 30:2 37:23 165:20

**drew** 58:16,23 59:6

**drop** 80:1

**dropped** 86:18 120:3

**dropping** 86:13

**duchin** 9:9

**due** 108:4 113:19 157:11

**duly** 4:2

**e**

**e** 15:12 106:11 188:1 189:1 191:3,3,3

**earlier** 29:16 35:3 45:16 148:22 179:11

**early** 178:9

**easier** 42:25

**eastern** 153:22

**ecological** 20:9 26:16

**edges** 97:23 98:2 98:6,21 132:14 132:23

**education** 19:14

**educational** 2:14 19:8

**effect** 32:7,10 115:3 116:2 118:2 122:10,12 130:7 155:6 159:17 170:11

171:2

**effectively** 79:13 101:21 102:4

**effectiveness** 31:25

**effects** 115:19

**efficiently** 36:13 37:24

**effort** 55:14

**efforts** 72:25

**eight** 85:21 86:5 109:16 138:17 139:6 173:10,12

**either** 27:17 64:4 87:14 91:15 94:15 104:6 106:20 112:3 115:1,23 118:23 126:17 133:10 176:21 177:2

**elaborate** 74:19 75:15

**elect** 32:12 110:4 110:19 122:12 183:13

**election** 3:8 12:14,18 32:4 109:25 159:21 170:14 177:16 181:24 182:2

**electoral** 182:9,9

**eliminate** 81:8

**eliminated** 87:9

**elizabeth** 3:15

**email** 11:7 46:14 184:20

**emphasize** 39:19

**empirical** 22:1 83:1

**enact** 110:4 144:11 182:4

**enacted** 24:2 29:16,20,24 30:8 30:14 32:1 41:24 49:3,25 50:9,9,14,20,21 51:6,12 52:8,11 52:21 53:5 55:3 55:17 57:1 58:6 58:11,13,16,20 58:23 59:2,3,7 59:10 61:14,14 63:9 66:18 74:22 76:6,8,12 77:23 78:1,3 82:4,6 83:11 87:20 88:3,12,24 89:19,23 90:1 91:4,8 92:18 93:3,9,10,16,20 94:2,11,18 95:11 95:19,21 96:6,8 96:11,25 97:14 98:14 100:11,12 104:9 106:1 107:6,10,21 111:10 112:11 113:1,5,7 114:10 119:5 120:1,9,20 121:14,19 122:22 123:20 124:12 127:9 129:5 130:18 131:3,6 132:22 133:21 134:8

Kosuke Imai, PhD

August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[enacted - expedited]**

Page 16

135:20 136:9
137:5,9 141:1,11
141:25 144:12
144:18 147:6
149:15 150:2,10
150:20 151:18
151:19,21
152:25 153:25
154:19 155:19
156:23 157:20
158:9 160:16
161:7,16 165:8
167:8 168:17
169:12,19 172:5
172:13 173:2
179:18,25 180:1
180:23
**encompass**
104:17,18
**encourage** 78:14
80:15
**encouraged**
78:15 82:7
**encouragement**
80:18
**encourages**
79:21 168:9
**ended** 13:10
**ends** 117:5
**energy** 39:4
**enforces** 95:5
**engagement**
14:2
**ensemble** 44:6
44:17
**ensure** 33:3,22
79:22 81:3
139:7

**entire** 154:13
156:17 159:7
160:11 161:2
180:21,21
**entitled** 5:14
**enumerate** 37:8
**enumeration**
37:7
**equal** 72:6,10,18
72:22 77:19
79:14 89:23
95:9
**equality** 73:1,13
**equalize** 75:11
75:19 77:3,7
155:20
**equalizing** 76:13
**equally** 82:5
175:19
**errata** 190:11,13
190:17
**especially** 38:13
39:12
**essentially** 41:3
41:11 131:14,21
132:21,22
**establish** 111:14
**et** 1:4,7 2:3
15:17 190:4
191:1 192:1
**evaluate** 19:24
20:8 49:14,16,24
52:6 57:21 58:4
58:5,20,25 61:24
76:7 144:18,23
**evaluated** 39:22
40:13 52:8

**evaluation** 30:12
49:25 59:2
**events** 187:9
**eventually** 21:20
23:1,5
**evolved** 27:13
**exact** 58:18 72:8
72:11 120:5,21
120:25 147:16
162:3 173:23
174:1
**exactly** 12:5 56:3
57:13 94:6 96:7
134:11 161:19
162:16 168:21
**examination** 4:3
177:23 182:16
188:3,5,7,9
**examine** 29:23
92:5,8 143:25
144:4 156:7,14
180:22
**examined** 43:24
152:6 164:17,21
165:3
**examines** 40:25
**examining**
156:18
**example** 12:3
21:20 32:11
37:15 50:24
63:21 64:1 67:7
78:14 79:23
80:9 81:3,13
88:17 95:18
100:21 103:9
104:15,16
110:17 124:10

125:8 165:9
168:5 178:18
180:10 181:24
**exceed** 71:18
**exclude** 56:22
**excluded** 140:14
142:19 143:15
**excuse** 70:17
161:7 172:21
**exhibit** 7:25 8:5
8:5,16,19,21
9:16,20 10:2,15
10:23,24 11:3
16:9,13,14 18:1
18:3 19:1,3 25:3
25:14,16,16 34:2
34:3,8,10 46:24
47:4,18 65:7,9
65:13 68:15,16
69:12,14,19
72:13 73:7
99:14 101:5
173:8,12,13
189:4,7,9,11,14
189:16,20,23
**exhibits** 6:22
174:10 189:3
**exist** 124:25
**existing** 35:7,25
36:15,24 37:2,19
38:1,10 39:5,10
41:24 43:2,17,22
103:3,5,15
105:22
**expect** 91:11
**expedited** 185:1
185:10

**[expert - first]**                                                          Page 17

expert   7:22 8:24
  9:2,6 11:2,21,24
  12:22 13:3,14,16
  14:13 15:2,7,19
  15:24 16:5,9,19
  22:5 23:12
  24:25 26:8 27:1
  27:2,12,12,20,23
  27:25 28:7 29:2
  29:6,9 43:15
  45:25 47:15,24
  47:25 48:16
  54:10 55:10,19
  59:19,24 63:12
  69:6 70:5 74:5
  77:15 189:7
expertise   17:10
  19:25
experts   9:4
expires   187:24
explain   22:11,15
  22:16 65:20
  67:5 75:25
  80:11 108:11
  132:4 151:12
  160:1 180:19
explained   23:12
  42:20 63:3
  105:25 141:13
  141:17 181:15
explains   112:11
explanation
  70:24 92:9
  150:25
explanations
  158:18
explicit   44:5

explicitly   48:13
explore   37:24
  66:1
extensively
  43:15
extent   48:5
  53:25 56:17
  61:4,7,12 87:8
  100:9,12,16
  101:19 102:2,16
  103:6,8 105:2,5
  105:11 153:9
  168:7,11
extra   151:25

**f**

f   101:14 107:25
  108:2
facebook   45:21
fact   23:6 33:18
  44:16 60:16
  62:16 75:20
  108:4 121:23
  141:17 154:11
  154:11 159:5
factor   71:17
  82:23,25 99:20
  140:2,5,7,22
  141:1,3,7 142:10
  144:1,5,11,16
  181:8
factors   40:7 55:5
  56:18 57:6,7,8,9
  57:11 58:3,8
  61:19,22 62:1
  63:6 78:5,6,11
  78:12 80:21
  82:23 84:9,18

86:4 91:7
  141:12 157:3
  181:7
fails   190:19
fair   5:25 6:1
  67:20 84:2 87:6
  100:23
falling   94:14
familiar   93:23
family   23:19
  24:16 65:10,16
  189:14
far   87:2
favored   182:5
february   187:25
federal   73:13,25
feedback   13:1
fees   14:21
fewer   76:15
  89:22 92:2 93:8
  93:13,15,19 94:1
  94:5 95:9 161:6
  166:25
field   20:3 33:23
  40:10
fifield   45:2,5,12
  45:18 46:9,12,13
  46:19,21
figure   46:25
  68:22 89:21
  90:3,5 94:7,22
  94:23 106:23
  107:4 114:12
  116:11 118:13
  120:11,12,13
  127:18,23,25
  128:5,6,12,12,13
  128:14,15

130:14,15,16,24
  132:14 133:2
  146:6,8 151:10
  151:12,14
  152:19 158:11
  159:24 160:1,4
  160:24 161:22
  162:13 163:9,9
  163:18 167:6
figures   15:17
  97:18
file   17:24 26:13
  173:10
filed   27:2
files   12:10 26:11
  26:14 102:9
final   13:10 52:23
  56:9 59:3,5,22
  62:4 86:16,17,19
  103:17 139:13
  139:19 178:3
  179:25
finding   117:14
  117:20 123:22
  141:10 149:25
  151:8
fine   38:14
  129:19 179:24
  185:6
firm   4:12
first   4:2 9:16
  13:22 14:1
  36:17 40:18,21
  44:3,23 45:2
  64:12,13 66:2
  76:4 78:25
  95:24 104:13
  112:19 113:2,23

**[first - given]**                                                   Page 18

127:4 140:9 156:19 158:6 169:14

**five** 7:3 65:8 68:10,13 72:14 72:15 90:11 92:6,11 99:8,9 138:9

**fixed** 114:10 154:4

**flip** 72:13 145:17 146:6

**flipping** 39:9 163:17

**floor** 2:15

**florida** 27:4

**focus** 20:4 26:12 29:11 96:3,4 123:7

**focused** 160:14

**focuses** 49:25

**focusing** 164:13 167:12

**folder** 8:5 9:17

**follow** 14:11 22:17 47:9

**followed** 83:10 137:22 184:2

**following** 33:23 47:11 61:12

**follows** 4:2

**footer** 38:21

**footnote** 44:23 44:24 71:23

**foran** 3:21

**foregoing** 187:5 192:5

**forget** 66:23

**form** 5:14 11:17 13:18 57:2,20,22 59:12 62:7 66:13,21 137:17 141:4 143:6 149:3,6 165:6,22 171:23 178:6 179:1

**formal** 14:2

**forman** 3:9,14

**formed** 175:5,8 175:24 176:4,10 176:11,14,19,23 177:1

**former** 45:7

**formula** 99:25

**formulate** 11:1

**formulated** 110:16

**formulation** 132:17

**fort** 187:11

**forty** 65:23

**forward** 93:25

**found** 29:9 113:18 141:16 156:20

**four** 7:2,2 27:3 34:2,7,8,9 72:18 90:11 92:6,10 128:5,6

**fourth** 38:24 43:4

**fraction** 98:6,21 132:13,22

**fractions** 97:23 98:1

**freeze** 61:10 135:8

**freezes** 103:9,11

**frep** 24:7

**frequently** 116:17 117:12 117:16 124:21 126:11 146:21

**friday** 7:5

**front** 73:10

**froze** 131:2 157:8

**frozen** 127:9 133:11

**full** 4:8 21:24 66:2

**function** 39:5

**fund** 2:14 14:3

**further** 127:5 150:25 177:11 184:13 187:7

**g**

**g** 15:13

**general** 38:7 39:18 40:2,8 55:7 83:11,18,22 83:24 84:8,13 136:18,22 152:17

**generally** 29:19 38:17 67:3

**generate** 32:24 33:23 35:17,17 35:20 38:2 41:8 41:25 44:17 50:16,17,18 52:19 75:22

76:5 86:24 89:18 92:2 97:21 152:13

**generated** 44:6 52:25 59:8 75:9 75:19 87:15

**generates** 33:12 40:22 51:3 82:17 95:3

**generating** 35:21 36:1,2 75:13 103:5

**generation** 51:11

**generic** 139:3

**geocoding** 26:19

**geographic** 73:3 88:2,14,23,23

**geographical** 31:1,16 60:13,20 105:18 126:1 132:12 168:14

**geographically** 70:19

**geography** 31:8 63:3 101:18 102:1,7,9 104:10 104:18

**gerrymandering** 28:10,12,14,16 28:20,22 111:5,8

**give** 87:19 124:6

**given** 75:7,24 80:25 101:18 132:7 138:16 153:24 173:21 173:22 180:7 192:9

**[gives - higher]**                                                   Page 19

| | | | |
|---|---|---|---|
| **gives** 33:21 | **good** 4:5,6 | **greenville** 3:5 | **hand** 90:5 |
| **glad** 90:2 162:5 | 185:11 | **group** 31:7,10,15 | 116:11 187:10 |
| 175:19 | **gore** 2:20 4:4,11 | 124:7 125:25 | **handles** 41:17,18 |
| **global** 167:18 | 9:25 13:6,12 | 149:9 | **handwritten** 8:8 |
| **go** 5:15 24:25 | 16:12 19:6 25:9 | **growing** 37:15 | **happen** 67:8 |
| 25:18 43:3 | 25:13,17 34:6 | **guarantee** 33:16 | **happened** |
| 44:22 49:13,21 | 47:3,8,14 48:8 | 33:19,21 70:22 | 122:22 123:5 |
| 56:1 62:20 | 48:14,21 49:12 | **guess** 70:25 | 180:24 |
| 64:23 65:2,7,21 | 49:20 51:19 | 109:15 146:14 | **happens** 95:1 |
| 68:10 77:8,15 | 52:2,14 53:21 | 147:15 174:12 | 152:14 153:7 |
| 89:1 95:3 99:7 | 54:8,20 55:20,24 | 177:21 179:22 | **happy** 185:7 |
| 101:9 106:23,23 | 55:25 57:3,23 | 185:7 186:8 | **hard** 21:1 39:8 |
| 109:12 113:11 | 59:15,17 60:9 | **guidance** 15:16 | 79:3,16 89:16 |
| 113:23 126:20 | 62:10,16,19,23 | **guided** 96:15 | **harpootlian** 64:8 |
| 126:20 130:11 | 62:24 63:14 | **guideline** 8:2,3 | 145:15 |
| 134:22 138:2 | 64:22,25 65:12 | 69:23 76:23 | **harvard** 19:12 |
| 151:10 159:1 | 68:21 69:18 | 96:19 99:9 | 19:13 |
| 172:18 177:4 | 77:8,11 126:20 | 112:1 180:13,15 | **head** 5:5 170:22 |
| **goal** 52:5,5 56:4 | 126:24 134:22 | 181:3 182:8 | **heading** 108:2 |
| 58:5,19 59:5,6 | 134:25 137:18 | **guidelines** 8:17 | **heavily** 84:9 |
| 61:25 67:10 | 143:7 148:21 | 8:18 68:18 69:2 | **heavy** 89:11 |
| 76:7,9 83:12 | 149:4,11 165:17 | 69:15 72:2,3,6,6 | **help** 86:21 89:12 |
| 94:16 136:19 | 166:1 172:1 | 72:10 73:8 | 128:4 144:8 |
| 164:19 167:15 | 173:16 177:4,7 | 74:11,12 83:14 | **helped** 15:16 |
| 180:20,21 | 177:10 179:1,11 | 96:17 99:11,15 | **henry** 190:4 |
| **goals** 81:2 | 181:11 182:17 | 101:6,7 102:21 | 191:1 192:1 |
| **goes** 23:4 | 184:12,24 185:1 | 103:1 136:25 | **hereto** 192:7 |
| **going** 5:24 9:15 | 185:6 188:6,10 | 180:5,7,9 181:20 | **hereunto** 187:10 |
| 10:1 16:4 17:13 | **graham** 28:21 | 181:22 183:3,9 | **hierarchical** |
| 17:22 24:19 | **graphical** 21:21 | 183:14,17 | 79:1,2 139:10 |
| 34:1 36:9 37:21 | **gray** 158:17 | 189:18,20 | **high** 148:8 |
| 38:19 46:24 | **great** 6:9 29:23 | | **higher** 85:10 |
| 48:4,22 64:23 | 69:12 114:11 | **h** | 110:23 119:19 |
| 65:14,19 66:24 | **greater** 20:1 | **h** 15:10 189:1 | 120:19,23 121:7 |
| 68:15 69:9,9,12 | 72:2 74:2,10,13 | 191:3 | 121:19,24 130:3 |
| 76:15,21 91:20 | 74:20 75:6 | **half** 64:23 | 130:20 141:18 |
| 96:22 139:9 | 77:25 78:2 | **halves** 166:17 | 161:15 172:12 |
| 173:7,12 184:17 | | | |

**[highlight - included]**                                      Page 20

| | | | |
|---|---|---|---|
| **highlight** 43:16 | 72:17 74:6 | 163:11 | **important** 5:20 |
| **highly** 39:6 | 81:17 85:1,19 | **imagine** 62:23 | 20:3 41:17 76:5 |
| 112:5 150:22 | 94:25 99:16,21 | **imai** 1:11 4:1,5 | 172:11 182:4 |
| **hired** 13:21 | 101:13 104:24 | 4:10,11 6:10,16 | **importantly** |
| **histogram** 90:6 | 106:13 107:3 | 9:15,22 10:5 | 45:6 |
| 91:2 107:16 | 108:8 111:18 | 11:14 13:20 | **impose** 41:19 |
| 120:10 121:13 | 114:13 115:10 | 16:4,10,14 17:13 | 42:22 57:14 |
| 130:25 133:2 | 116:15 118:14 | 18:10,17 19:4,7 | 58:6 63:2 |
| 152:14 160:22 | 124:11 125:20 | 25:18 28:25 | 142:21 |
| 160:23 161:20 | 127:19 131:5 | 34:1,11 36:17 | **imposed** 33:10 |
| 163:23 164:1,4 | 132:2 135:13 | 40:15 43:3 | 33:11 39:13 |
| 170:16 | 138:12 142:7 | 47:22 48:22 | 58:1 61:1 67:11 |
| **histograms** | 146:4 147:9 | 56:1 59:18 | 106:22 140:24 |
| 107:2 127:15 | 148:12,24 | 62:12,13,20,25 | **imposes** 54:12 |
| **hoc** 68:18 189:17 | 149:17 150:24 | 67:20 68:6,23 | **imposing** 13:10 |
| **hold** 29:14 32:22 | 154:9 155:18 | 77:12 99:7 | **impossible** 39:11 |
| 65:23 72:15 | 156:6 158:3 | 101:3 112:4 | 42:19 |
| 87:13 88:9 89:4 | 159:25 163:24 | 113:23 135:1 | **impressions** |
| 109:14 145:21 | 164:3 165:2 | 173:20 177:7,10 | 178:23 |
| **hope** 34:18 | 169:22 170:18 | 177:14,25,25 | **improved** 26:18 |
| 68:22 184:16 | 172:14 176:9,18 | 179:11 180:3 | **improves** 38:10 |
| **hopefully** 65:14 | 181:21 | 182:14,19 | **impute** 26:15 |
| **hour** 7:11,11 | **hum** 179:21 | 183:16 184:12 | **inadmissible** |
| 64:23 | **hundred** 76:13 | 184:19 188:4 | 29:9 |
| **hourly** 14:20 | 76:19 | 189:6,7,9 190:5 | **inbox** 11:9 |
| **hours** 7:11,12 | **hypothetical** | 191:2,24 192:2,4 | **include** 37:19 |
| **house** 3:2 6:14 | 91:22 | 192:12 | 55:3,4 56:11 |
| 8:1,17 14:15,16 | | **impact** 67:7 | 57:11 62:3 |
| 28:5,13,13,14 | **i** | 168:15 180:25 | 63:17 103:20,24 |
| 68:7,12,13,17 | **ideal** 72:23 | **implementation** | 104:6,25 106:2 |
| 69:3 72:2,5,14 | **identification** | 80:19 | 107:1 111:13,20 |
| 72:16 99:9,10 | 9:23 16:11 19:5 | **implicated** | 112:20,22 113:9 |
| 100:24 136:25 | 34:5 65:11 | 170:20 | 117:22 126:15 |
| 177:19 180:5,14 | 68:20 69:17 | **implications** | 160:11 170:16 |
| 189:16 | 173:14 | 61:5,16 103:14 | 170:23 |
| **huge** 132:24 | **identify** 28:9 | **implies** 154:12 | **included** 12:1,6 |
| **huh** 20:19 30:19 | **image** 121:17 | **implying** 108:5 | 12:19 17:23 |
| 37:1 70:16 | 123:9 161:21 | | 27:4 37:4,6 |

Kosuke Imai, PhD                                                    August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[included - judge]**                                                  Page 21

47:25 51:21 54:11 55:11 59:9,20,21 60:5 63:12 113:21 124:16 140:18 143:10 169:3,5 178:10
**including** 54:24 56:8,23,23 106:3 181:10
**incorporate** 36:12,21 39:4 49:23 56:7 180:18 181:4,5
**incorporated** 112:2 136:10 142:24
**increase** 81:7 136:3
**increases** 141:19
**increasing** 136:15
**incumbency** 56:15 60:25 61:3 79:23 81:4 81:8 84:21,23 85:20 86:22 87:16,23 139:16
**incumbent** 12:12 73:23 77:21,22 78:15 86:20 105:5 106:8 116:22 153:9,12 153:17
**incumbent's** 87:20
**incumbents** 78:17 79:25

80:6 81:7 86:11 86:14,16,25 103:7,25 104:2,5 106:5
**independent** 35:25 58:18
**index** 3:23 188:16,18
**indication** 180:10
**indirectly** 100:8 100:17
**individual** 20:11 149:2,7
**individuals** 26:5 26:11 115:8,8 118:21 160:17 160:17 170:19
**inference** 20:10 26:17
**influence** 57:12 58:9
**inform** 84:13
**information** 12:11 26:13,14 55:4 59:1 104:5 109:19,21,22 111:9,14,23 112:1 118:10,23 159:19,22 170:13 181:16 188:16,18
**informed** 67:15 83:13
**inheriting** 58:8
**inherits** 61:18,22
**initial** 157:15

**input** 44:24 93:6
**inputs** 102:17
**inquire** 20:10
**instances** 7:16
**instruct** 78:13
**instructed** 80:15 96:10 103:7 110:12,22 112:3
**instructing** 55:20
**instruction** 182:1
**instructive** 67:2
**instructs** 5:15
**insulate** 62:17
**intend** 16:23 17:1
**intent** 30:3,5 118:1 136:22 182:6,22
**intention** 58:18
**intentional** 30:1
**intentionally** 29:24
**interchangeably** 109:10,11
**interest** 101:19 102:1,7,14 104:23 105:1,5,7 105:10,16,19 132:1
**interested** 19:21 19:23 187:9
**intern** 3:21
**interpretation** 22:1
**introduce** 9:16 68:23 69:19

**introducing** 16:13
**intuitive** 85:9
**invalid** 40:12
**involve** 51:12 162:1,21
**involved** 15:6 27:14 42:11 45:15
**involving** 179:4
**isolate** 57:10 105:25 180:25 181:8
**isolating** 55:1 56:6,16,25
**item** 11:10
**items** 11:6,10
**iterative** 22:21

**j**

**jacksonville** 27:3 27:6,10 28:18,19
**jasper** 134:20 156:12 157:19
**jcusick** 2:17
**jmgore** 2:22
**john** 2:14,20 4:11 48:4 62:22
**joined** 101:20 102:2
**jones** 2:19 4:12
**jonesday.com** 2:22
**journal** 21:21 23:3
**journals** 22:22
**judge** 99:24 100:5

**[judged - left]**                                                          Page 22

**[legal - majority]**                                    Page 23

**legal** 2:14 14:3
  30:15 31:16
  36:12,21 67:2,14
  67:15,17,22,24
  68:4 125:24
  137:15,20,21,25
  184:6 190:23
**legally** 66:4,19
**legislative** 19:15
  20:4 27:14 28:7
  68:19 150:13
  155:2 158:23
  170:8 189:19
**legislators**
  150:17 182:23
  183:2,7,12
**legitimate** 73:19
**letter** 10:17 14:2
  72:21 103:2
  106:11
**level** 74:18 75:10
  75:14,23 76:25
  77:1 87:24
  91:25 136:9,14
  157:13 171:12
**liberal** 19:10
**liberties** 2:4,9
**lieu** 48:17
**light** 40:15
**lighter** 116:19
**likelihood** 146:9
  146:16
**likewise** 103:24
  175:8
**limitations** 73:3
**limited** 64:15
  91:8 98:20

**limits** 79:4,13
**line** 94:11
  107:17 120:24
  131:16 148:25
  149:18 151:18
  151:21 158:1,14
  158:17 163:21
  165:20 188:2
  189:2 191:4,7,10
  191:13,16,19
**lines** 149:23
  173:25
**list** 11:10 14:10
  26:25 27:11
  66:11 70:17
  77:17
**listed** 10:22,24
  11:21,23 14:13
  66:10 106:17,19
  180:12,15 183:9
  184:1
**lists** 103:2
**literature** 21:12
**litigation** 16:21
**little** 8:11 13:21
  32:18 42:3 70:3
  89:12 90:9,17
  97:6 132:23
  144:8 175:11,21
**liu** 9:7
**live** 31:15 118:21
  124:7 128:3,9
  148:14 149:10
  152:1,22 160:5
**lived** 128:23
**lives** 116:23
  117:2,5 151:15
  153:10

**living** 31:8 60:19
  123:25 124:4
  125:25
**liz** 177:15 184:15
**llp** 3:9,14
**loaded** 65:13
**loading** 16:14
**local** 64:10,14
  122:16,24
  134:12 135:8
  141:16
**localized** 81:13
  84:23 89:6 97:8
  97:9 112:19
  113:24 141:18
  148:15
**location** 1:14
  12:12 55:15
  60:17 87:23
  124:8 125:18
  146:23
**lodging** 55:22
**long** 7:9 23:6
  47:12 111:1
**longer** 17:18
**look** 12:20 26:21
  60:12,14 61:7
  76:18 92:12
  93:7 97:21
  106:11 111:11
  123:18 125:11
  125:14 130:14
  130:23 144:14
  157:14 158:11
  160:4,23 167:11
  171:8 180:1
**looked** 179:12
  179:17

**looking** 47:13
  74:25 93:18
  98:16,18,23
  123:18 127:10
  179:22
**looks** 84:22
  107:6 117:10
  131:18
**lot** 35:12 76:14
  161:8 166:24,25
  172:25
**loud** 36:9
**louisiana** 2:21
**lower** 85:11
  119:21,25
  121:11 130:4
  139:24 147:7
  161:14 172:20
**lowest** 73:1
**luke** 4:14

**m**

**m** 2:5,10,20 3:15
  4:10
**ma** 1:14
**mace** 88:19
  116:22 117:16
  117:22 118:5
  155:8
**mace's** 118:3
  146:20 181:24
  183:8
**main** 3:5,11,16
**maintain** 171:12
**major** 98:17
**majority** 107:12
  107:22 131:7,15
  154:12

**[makers - mimic]**                                                    Page 24

makers    182:4
making    39:7
  73:20 81:10
map    28:25 29:3
  29:16,19 58:12
  58:15,16,19,23
  58:25 59:1,6
  76:7 83:16
  117:21,25
  118:21 154:21
  154:25 155:12
  159:11,16 170:2
  170:5 178:2,6,11
  182:4,4,6,22
  183:1,7,12
maps    36:11 46:9
  83:17 179:12,14
  179:18,25
march    27:5
mark    65:7 68:15
  69:12 173:7,12
marked    9:22
  16:10 19:1,4
  25:3,13 34:5
  47:18 65:2,11
  68:20 69:17
  73:7 99:14
  101:5 173:14
markov    23:22
  33:7 35:6,10,19
  35:24 37:3,4
  38:1,6 50:3,8
  65:10,16 189:14
massachusetts
  6:17
master's    19:11
materials    7:24
  7:25 8:19,20

11:12,12
math    129:14
mathematical
  23:16 33:12,19
  33:20,21 67:18
  81:18 98:9
  99:25 100:18,19
  100:22,25
  102:22 105:17
  111:2 132:16
mathematically
  110:16
mathias    3:4
  177:18,18
  184:17 186:7,8
  186:12
matter    53:13
  58:22 73:17
matters    54:3
  133:17
maximum    76:14
mburchstead
  3:12
mc    38:25
mcm    39:16
mcmaster    190:4
  191:1 192:1
mcmc    37:18 38:1
  39:2,19 40:9,16
  41:3,18,23 44:8
  44:13,17
mean    16:1 22:20
  23:7 32:9 35:12
  40:10 49:5 50:5
  53:23 59:23
  65:20 66:20
  78:8,25 83:24
  84:12 85:15

91:16 92:7,19
96:13 102:6
  104:16 108:11
  108:19 110:15
  115:21 120:2
  121:10 130:1
  132:7,10 138:20
  139:6 140:4,6
  141:14 143:4
  148:19 159:20
  165:7 166:2,7
  169:2 172:4
  174:11 185:14
meaning    31:17
  85:9 115:21
  125:24 140:23
meaningful
  131:20
means    4:21
  85:17 101:21
  102:3 108:23
  125:25 130:21
  138:22 139:1
  167:1 171:20
  172:12
meant    85:16
  178:6
measure    98:1,22
  102:22 132:11
measures    97:19
  97:22,24 98:4,9
  100:18 132:11
media    101:20
  102:3
members    63:22
  145:2
memory    72:13
  111:7

mention    78:23
  102:22 178:9
  181:25
mentioned    86:10
  91:17 102:24
  119:3 178:14
  180:14 181:2
  183:19 184:1
mentions    26:4
  68:7 76:23
merge    23:11,21
  24:2 33:6 41:5,6
  42:6,8,10 79:10
merged    79:8,9
merges    79:9
merging    41:11
met    81:3
method    20:9
  35:1,4,6,10,11
  75:19 93:23
  97:16
methodological
  43:13
methodology
  19:23,25 26:5,10
  26:13 32:19
  33:3,16
methods    20:1
  23:15 24:17
  36:11,15,24 37:2
  37:3,6,12,19
  38:11
metric    130:20
mgl    1:6
michael    3:10
mill    187:12
mimic    83:16

**mind**  163:17
**minimizing**
   106:12 108:22
**minimum**  90:20
   91:11
**minus**  71:19
   74:8 79:6,15
   90:22,23 91:8,19
**minute**  77:9
   123:8
**mirror**  121:17
   123:9 161:21
   163:11
**mischaracterizes**
   13:4 59:13
   148:17
**missing**  11:10
**mistaken**  117:3
**misunderstood**
   134:3
**mix**  39:6 44:9
**model**  60:24,25
   82:11,15 84:9,11
   84:12,15 85:9
   100:4 132:4
   146:20 161:23
   163:12 171:15
**moderate**  89:10
**modify**  75:10
**modifying**  24:4
   24:7 35:22 36:2
**moment**  47:7
   66:2 126:21
   167:18 177:5
**monday**  185:4,6
   185:11,18,19
   186:2,9

**monitor**  18:13
**monte**  23:15,19
   23:22 24:12,16
   33:7 34:3 35:1
   35:10,11,15,19
   35:24 37:3,4,12
   38:1,6,10 50:3,8
   189:11
**moon**  9:9
**morning**  4:5,6
**motives**  182:22
**move**  97:3 135:4
   153:13 169:8
**moved**  60:15
   122:4 147:18
**movement**
   176:25
**moving**  115:1,18
   115:21,22,23
**msmc**  43:1
**multiple**  31:2
   35:18,20,22
**municipalities**
   78:2 94:20,21
   95:6 96:25 97:2
   102:16 105:4
   108:5,12,16,17
   108:22 109:3,5
   168:12
**municipality**
   96:23 108:7,12
   108:18,19

---

**n**

**n**  15:12,13 188:1
**n.w.**  2:21
**naacp**  1:3 2:3,14
   14:3 64:1,3

   145:4 190:4
   191:1 192:1
**naacpldf.org**
   2:17
**name**  4:8,9,11
   26:14 27:16
   179:19
**nancy**  88:19
   116:22 117:15
   117:22 118:3,5
   146:20 155:8
   181:24 183:7
**natural**  123:7
**nature**  35:14
**near**  116:24
**nearly**  72:22
   85:8
**necessarily**
   22:20 23:7
   60:18 75:17
   108:16 141:23
   147:20 157:7
   174:11
**necessary**  192:6
**need**  5:3 6:2 8:7
   85:5 96:18
   125:11 180:24
   185:4,19 186:5
**needs**  14:24
   40:12,13 86:6
   104:4
**neither**  187:7
**nested**  108:15,16
**net**  115:2
**neutral**  112:21
   113:3,4,18
**never**  22:20 23:8
   61:25

**new**  2:16 25:13
   41:25 79:11
   173:7
**nexsen**  3:3
**nexsenpruet.c...**
   3:6
**night**  129:14
**nods**  5:4
**non**  27:23
**noncontiguous**
   56:19 57:16
**nonlegal**  137:16
   137:22
**nonpartisan**
   111:10,15
**normally**  54:23
**north**  119:16
   125:8,19 126:16
   147:17 151:1,5
**notary**  187:3
   192:13,19
**note**  190:10
**noted**  179:13
   192:7
**notes**  8:9
**notice**  9:21 10:8
   25:9 85:20
   189:4
**number**  20:25
   21:2 58:3,8
   60:17 72:21
   77:24,25 78:1,3
   79:4,5,14,15
   80:1 85:2,3 86:3
   86:5,8,13,15,18
   87:12,12,14,19
   87:19 89:12,23
   89:24 90:11,14

**[number - ones]**                                              Page 26

| | | | |
|---|---|---|---|
| 90:16,20 91:12 92:13,24 93:1,2 93:7,15,18 95:10 96:20 98:19 108:18 114:18 116:6,8 120:25 127:21 130:21 133:18 137:1,3 138:4 139:18 146:13 147:8 150:21 151:14 154:4 160:7 168:10,12 170:19 173:2 **numbered** 34:8 43:8 **numbers** 80:10 90:10 104:8 116:16 147:16 162:4 170:17 172:10 174:22 176:2 183:25 **numeral** 72:18 73:12 99:17 101:11 **nw** 2:5,10 **ny** 2:16 | **objection** 5:13 13:4 49:11,19 51:18 52:1,13 53:20 54:7,19 55:18,23 60:6 63:10 148:17 **obligation** 4:22 **observe** 142:1 **observed** 141:10 **obvious** 170:25 **obviously** 5:14 98:5 102:8 **occur** 31:10 **occurs** 31:19 124:21 **offer** 16:23 17:11 **offered** 174:13 174:17 **offers** 176:7 **official** 187:11 **oh** 14:10 15:12 17:17,25 19:16 20:23,25 21:4,17 25:21 26:1 28:19 32:14 38:23 45:13 | 144:23 153:11 154:3,19 158:8 160:25 164:7 168:20 170:22 171:5 173:23 175:15 179:21 **ohio** 14:15 27:13 **okay** 5:6,17 6:9 6:12,16 9:24 10:3 13:17 14:13 15:10 16:6 17:15,17,25 18:9 22:19 25:2 25:7,23 26:3,23 28:11 29:14,14 32:22 34:9 36:8 38:23,23 40:18 41:1 43:6,9 47:2 47:15 48:8 50:7 50:12,15,22 51:9 52:24 53:7,12,14 54:16 55:14 60:20 61:21 63:20 65:2,4,23 | 105:12 106:11 109:1,14,17 111:16 112:16 113:13,25 114:3 116:5 117:8,15 118:12 119:15 121:3,4 123:14 124:10 126:6,6 126:22 127:2 128:11,14,14 129:13,19 130:13,15,15 131:15 133:1,7,9 133:12 135:6 137:2 138:4,9,9 138:10 143:13 143:19 144:17 144:25 145:10 145:19,21,21,23 146:8,25 149:14 152:3,13,24 156:14 157:25 |

| | | | |
|---|---|---|---|
| **o** | | | |
| **o** 15:10,12 **oath** 4:21 **object** 5:12 48:4 57:2,20 59:12 62:7,7 137:17 141:4 143:6 149:3,6 165:6,22 171:23 179:1 | 46:2 49:5 79:2 90:4 91:3 93:4 109:8 112:24 113:16 114:25 115:25 119:13 120:12 122:14 124:20 128:8 129:11 132:6 133:8 134:1,14 135:25 137:4 138:7,22 144:13 | 65:23 66:15,25 67:25 68:11,13 68:14,23 69:11 70:2,4,7,11 71:1 71:17 72:12,15 72:15 73:6 78:19,23 80:7 84:17,19 86:9 87:4,18 88:5,7,9 89:1,4,4 90:4,18 91:23 92:22 93:21,23 94:19 96:10 97:5 99:7 99:9 101:8,10,15 | 159:2,4 160:13 163:17,19 168:22 169:10 171:8 172:9 173:9 174:2,5,13 174:21 175:2,18 175:22 182:20 184:23 185:8,17 186:3,6,13 **old** 25:11 **once** 6:11 33:11 35:16 49:5 50:18 79:13 122:1 **ones** 22:7 125:12 152:5 |

Kosuke Imai, PhD                                    August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[open - part]**                                    Page 27

| | | | |
|---|---|---|---|
| **open**  44:5 69:11 | **outlier**  49:9 | 138:8 145:18,22 | 43:11,12 70:10 |
| **opened**  9:24 | **outperforms** | 151:10 157:24 | 70:14 74:7,7 |
| 16:8 | 107:21 | 159:3,24 163:18 | 78:20,24 80:7,22 |
| **operate**  78:10 | **output**  82:20,21 | 174:3 176:5,6,16 | 81:15 84:22 |
| **operates**  102:9 | **outside**  61:11 | 176:17,24 188:2 | 88:6,11 89:2 |
| **operational** | 138:15 139:9,15 | 189:2 191:4,7,10 | 97:7 99:20 |
| 111:2 | 140:17 147:21 | 191:13,16,19 | 106:17 107:25 |
| **opinion**  30:4 | **overall**  71:19 | **pages**  127:14 | 108:1,2 109:18 |
| 57:22 66:13,13 | 73:2 98:16,23 | 145:17 164:2 | 109:19 114:11 |
| 66:21 112:8,10 | 100:10 135:14 | **pair**  80:6 81:7 | 119:3 121:1 |
| 112:13 137:15 | 140:1 | 86:11,14,15,24 | 129:1 138:3,8 |
| 137:16,19,20,23 | **overlap**  60:13,14 | 95:4 | 145:22 147:4 |
| 138:1 154:24 | 60:20,21 61:2,5 | **paired**  61:3 | 150:19 154:8 |
| 174:13,17 175:5 | 61:17 63:2 | 77:21 78:16 | 159:1 162:6,10 |
| 175:9 176:14,23 | 104:14 105:4 | 81:4 104:2 | 162:15 169:21 |
| 177:1 182:25 | | 105:6 | **paragraphs** |
| 183:4,6,10,11,15 | **p** | **pairing**  42:23 | 77:16,21 106:20 |
| **opinions**  11:1 | **p**  173:14 189:23 | 78:15 79:24 | 109:13 |
| 16:20,23 17:11 | **p.m.**  186:14 | 84:21,24 85:20 | **parallel**  35:18,20 |
| 29:9,12 175:24 | **page**  10:13,14,15 | 86:20,22 103:7 | 37:24 |
| 176:4,11,19 | 17:13,15 24:21 | 106:8 139:17 | **parameter**  79:20 |
| **opposed**  75:21 | 25:20,23 26:3 | 153:12 | 80:19 81:17 |
| 76:3,25 81:16 | 29:12,14 30:18 | **pairings**  56:15 | 93:5 |
| 86:7 125:14 | 32:21 38:19,20 | 87:16,23 | **parameters**  81:1 |
| 133:18 139:3 | 38:21,21 43:3,4 | **pairs**  79:25 | 82:19 84:15 |
| 167:12 | 43:5,8 44:23 | **paper**  7:23 21:20 | 85:7 93:16 95:8 |
| **orangeburg** | 65:21 66:3 | 21:23 22:20,22 | **part**  8:4,16,19 |
| 168:23 | 70:12,15,15,17 | 23:1,2,5,7 34:5 | 8:21 18:6 19:14 |
| **order**  41:21 | 70:17 78:18,21 | 34:14,16,21,25 | 19:18 20:9 |
| 105:25 112:24 | 84:22 88:8 89:2 | 36:7 189:12 | 23:15,18 24:16 |
| 142:23 155:20 | 89:4 94:23 | **papers**  45:9,10 | 30:1 35:23 46:3 |
| 181:8 | 99:15 101:9 | 45:11,13 | 54:10 61:12 |
| **orders**  31:7 | 102:25 104:22 | **paragraph**  25:19 | 62:14 63:5 69:5 |
| **outcome**  48:16 | 106:24 108:2 | 25:19,24,25 26:4 | 96:16 99:23 |
| 182:9 | 109:13,16,17 | 26:22 27:11 | 108:4 143:2 |
| **outcomes**  182:2 | 114:2,12 120:10 | 28:10,16 29:13 | 148:7 156:19 |
| **outlets**  101:20 | 120:12 127:3 | 30:17 32:21,23 | 174:9 178:6 |
| 102:3 | 130:11 138:2,4,6 | 38:24 39:24 | |

**[partially - plan]**                                                            Page 28

**partially** 61:1
**particular** 17:12
   21:24 22:2
   23:18 24:1,8
   31:1,7,19,23
   39:21 40:5
   42:24 56:4
   66:14,21 67:9
   75:3 79:23
   80:25 81:19
   86:6 112:7,9
   125:6,12 138:23
   139:3 142:12,16
   142:22 156:1
   157:11 164:15
   164:20,22 181:7
**partisan** 28:16
   28:22 32:15
   109:19,21,22
   110:16 111:5,7,9
   111:11,12,13,23
   112:1 122:14
   130:10 155:9
   159:19 170:13
**partisanship**
   176:17 181:12
   181:16
**parts** 49:15
   101:19 102:2
   117:10 155:12
   157:7,8
**party** 110:10
   187:8
**passing** 177:12
**patience** 93:22
**patricia** 2:9
   178:19

**pay** 174:12
**pdf** 38:20
**peer** 15:23 16:1
   20:12,21 186:8
**penalizes** 138:14
   138:21
**pending** 6:6
   187:8
**pennsylvania**
   28:4,5
**people** 14:1
   44:24 60:15,17
   60:18 71:22
   76:13,19 104:20
   115:12,15
   170:25
**percent** 12:18
   27:15 41:21
   45:21 71:20
   74:8,15 89:24
   115:12,16 116:1
   116:3 117:6,13
   120:4,15,15,18
   120:19 121:2,7,7
   121:11,24
   129:15,18,22
   130:3,4,8 135:15
   135:16 136:20
   136:20,23,24
   137:5,12 139:18
   139:21 140:2
   154:13 159:5
   161:1,1 162:6,10
   162:14 163:6,15
   165:9,12,25,25
   166:2,3,22,23,24
   167:4,5 169:23
   170:24 171:16

   171:20,21,24
   172:6,11,12,15
   172:22,23 173:1
   183:24,24 184:4
   184:5
**percentage**
   41:20,20,23 42:5
   87:15 110:24
   114:19,22 115:3
   119:6,10,19
   120:2 127:21,24
   127:25 128:16
   129:10 137:8
   147:6,13 160:8
   166:13
**perform** 54:22
   107:10
**performance**
   21:24 32:15
**performs** 107:7
   131:7
**periodic** 6:4
**permissible** 71:4
**permit** 72:3
**permitted** 74:11
**person** 45:2 74:2
   74:13,16 75:6
   91:9,20 166:15
**persons** 72:21
**ph.d.** 16:10
   189:7
**phd** 1:11 4:1
   9:22 19:12
   188:4 189:6
   190:5 191:2,24
   192:2,4,12
**phrase** 30:16

**pick** 37:13,14
**place** 7:4,5 95:15
   96:7 139:14
   142:1,14 155:17
   167:7 169:24
**placed** 4:20
   116:13,17
   117:16 118:5
   146:10,16,21
   147:19,20 151:6
   152:4,8,22
   155:13 168:10
**placement** 151:1
**places** 152:25
   153:25 160:16
**placing** 155:7
   159:18 170:12
   171:3
**plaintiffs** 1:5 2:2
   8:24 9:2 11:15
   11:25 12:8
   179:8
**plan** 16:20 23:17
   24:1,2,4 29:20
   29:24 30:8,15
   32:1,8 35:7,22
   36:1 41:24 43:2
   47:23 48:24
   49:2,4,9,14,15
   49:16,18,23,24
   49:25 50:4,6,9
   50:10,14,17,20
   50:21 51:7,12,17
   51:23,25 52:5,6
   52:8,12,21 53:5
   53:24 54:6,13,24
   54:24 55:3,4,7
   55:12,17 56:7,7

Kosuke Imai, PhD

August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[plan - plus]**

Page 29

| | | | |
|---|---|---|---|
| 56:9,24 57:1,5,8 | 125:7,10,17 | 36:2 37:9,23,25 | 142:20 143:2,9 |
| 57:18,22,24 58:2 | 127:9 128:20,24 | 38:2 44:7,18,19 | 143:14 144:2,6 |
| 58:5,6,7,9,11,13 | 128:25 129:5 | 46:9 50:19,20,23 | 144:14,15,16,21 |
| 58:14,16,20,23 | 130:18 131:3,6 | 51:4,11 52:20 | 144:22,24 145:1 |
| 58:24 59:2,3,7,9 | 132:21,22 133:5 | 55:7 57:22 | 145:8 147:8,12 |
| 59:11 60:1,4,22 | 133:21 134:9 | 58:14 63:21 | 147:20,24 |
| 60:23 61:5,9,13 | 135:21 136:9 | 66:3,4,17,18 | 148:13,20,20 |
| 61:14,14,15,18 | 137:5 139:8 | 67:1,3,21 68:4 | 149:22 150:5,23 |
| 61:22,25 62:2,5 | 140:10,13,17 | 71:9 75:22 | 151:20 152:21 |
| 63:3,9,18 64:1,3 | 141:1,11,12,25 | 76:14 77:4 | 152:25,25 154:1 |
| 64:6,8 66:6,18 | 142:18 143:1 | 78:14,16 79:21 | 154:12,22 159:6 |
| 74:1,22 75:9,19 | 144:10,12,13,17 | 79:22 80:2,6,16 | 159:7,13 160:10 |
| 76:6,8,12 77:24 | 144:18,21 145:4 | 81:7,11,22 82:3 | 161:1,5,14,16 |
| 78:1,3 79:17,25 | 145:7,13,15 | 82:5,14,17 83:3 | 162:1,7,10,17,20 |
| 82:4,6,8 83:11 | 147:2,3,6 149:2 | 83:21 84:16 | 162:23 164:18 |
| 84:10,14 87:20 | 149:15 150:1,2 | 86:11,13,15,17 | 164:22 165:4,24 |
| 87:22,25 88:18 | 150:10,10,14,20 | 86:17,18,19,24 | 167:7,12,13,22 |
| 88:18 89:19,23 | 151:4,6,9,17,18 | 87:9,14,19 88:18 | 169:24 170:4 |
| 89:25 90:1,15,21 | 151:20,21,22 | 89:18,22 92:1,21 | 172:19,21,25 |
| 91:4,8,12 92:5 | 152:7,12 153:2,8 | 92:23,25 93:8,10 | 173:4 189:12 |
| 92:10,13,13,19 | 153:14,19,25 | 93:11,12,25 | **plausible**  66:5 |
| 93:3,9,9,19,20 | 154:18,19,20,20 | 94:14,17 95:3,4 | 66:19 |
| 94:2,2,11,18 | 155:19 156:23 | 95:9,20 96:24 | **play**  55:2 153:5 |
| 95:11,19,21 96:2 | 156:23 157:21 | 97:21 98:12 | 153:20,21 |
| 96:6,8,12,25 | 158:7,9,9 160:19 | 99:23 100:6,11 | **played**  30:13 |
| 97:14 98:14,20 | 161:7 164:23 | 100:15 103:5 | 56:25 58:11 |
| 98:22 99:2 | 165:8,8,19 167:8 | 104:8 107:8,12 | 59:4 76:10 |
| 100:11,12 103:8 | 168:2,17 169:12 | 117:15 119:6,12 | 106:1 112:25 |
| 103:19 104:9 | 169:16,19 | 119:15,18 | 113:5 142:15 |
| 106:2,2,3 107:6 | 170:25 171:20 | 120:14 124:3,14 | 156:22 180:22 |
| 107:10,21,22 | 172:5,11,13,24 | 124:18,22,25 | 181:1 |
| 111:10 112:11 | 173:2 174:25 | 125:2,4,12,15 | **playing**  142:2 |
| 113:1,5,7 114:10 | 179:4 180:1,23 | 126:11,12 129:4 | **plays**  56:6 |
| 118:17,18 120:1 | 181:5,6,8,10,10 | 130:2 131:8,16 | **please**  4:9 5:21 |
| 120:1,8,9,20 | 183:12 | 132:23 138:14 | 6:3 15:9 67:5 |
| 121:4,15 122:22 | **plans**  31:24 32:2 | 138:21 139:14 | **plus**  53:3 71:19 |
| 122:23 123:20 | 32:25 33:17 | 139:19 140:3,15 | 74:8 90:21,23 |
| 124:12,17 125:6 | 34:5 35:18,20,22 | 140:19 142:6,10 | 91:8,19 |

**[point - principles]**                                 Page 30

**[printed - racial]**                                                                 Page 31

**printed** 7:23 8:6
**prior** 73:22
  99:23 100:5,15
**prioritized**
  180:11
**priority** 180:15
  180:16 182:13
**probability**
  148:8
**probably** 97:1
  104:14 146:24
  148:1,3 152:5
  161:24 162:2
**problem** 72:12
**problems** 43:18
**procedure** 88:11
**proceed** 24:10
**process** 21:22
  22:21 23:4,4,6
  58:21 63:23
  79:7 80:4
**produce** 10:20
  73:1
**product** 59:5
  181:4
**program** 70:21
  71:18 75:5 78:5
  78:9 93:1
  106:14 168:4
**programmed**
  51:1 92:17
  132:8 143:18
**progresses** 41:14
**prohibitively**
  44:9
**properties** 66:7
  81:10

**property** 33:12
  33:20 79:18
**proportion** 42:4
  42:25 116:7
  119:4,25 120:7
  120:14 135:15
  136:4,13,17
  140:1 147:5
  157:12 163:22
  163:25 164:8,11
  168:8 171:4,5,13
  171:14 172:25
  173:4
**proportions**
  170:17
**proposals** 39:9
**proposed** 63:22
  66:6 179:12
**prospect** 183:8
**protect** 48:13
**protected** 48:6
  59:14 62:9
**prove** 39:8
**provide** 12:8,14
  12:21 13:2
  46:21 121:13
  185:5
**provided** 13:8
  46:16,17 163:22
**provides** 174:23
  176:3
**provision** 96:19
**pruet** 3:3
**public** 63:22
  145:2 150:12
  155:1 158:23
  170:7 179:13
  187:3 192:19

**publication**
  10:25 20:16,22
  22:10
**publications**
  20:13 21:1,6
**published** 20:16
  20:22 21:21
  22:21 23:8
  34:16 45:14
  180:4,7
**pull** 16:4 17:22
  18:1 25:15 34:1
**purpose** 38:13
  76:12 113:20
  141:8,15
**purposes** 67:7
**put** 55:11 93:25
  94:16
**pyan** 2:12

**q**

**qualified** 29:2
**quantify** 87:14
**question** 5:21,24
  6:5,6 8:25 20:17
  22:12 36:17
  41:3 47:7 48:5
  50:2 52:16
  53:15 62:4,8,25
  81:12 83:2 84:2
  90:3,24 91:1
  112:9,12 115:4
  124:8,21 131:24
  134:3 137:20,21
  137:25 141:25
  144:3 155:15
  164:25 167:19
  175:20,21 180:2

**questions** 5:13
  5:16 14:11
  47:21 59:13
  63:15 70:8
  95:13 96:23
  112:15 177:11
  177:13,16,20,22
  181:12 182:15
  182:18 184:13
  184:18
**quite** 50:6,11

**r**

**r** 3:10 15:10,11
  191:3,3
**race** 26:5,11,16
  29:25 30:7,13
  40:19,21,24 41:1
  42:8 55:2 56:6
  56:16,25 57:9,10
  58:10 59:4 61:6
  61:10,23 76:10
  95:24 103:8,11
  106:1 109:18
  112:5,10,21,25
  113:3,4,5,18
  118:22 119:5
  140:25 141:7
  142:2,15 143:25
  144:5,11,15
  156:22 157:1,4
  168:9 180:22,25
  180:25 181:8
**racial** 12:10
  28:10,11,14,19
  102:13 118:23
  141:12 184:11

3:21-cv-03302-MGL-TJH-RMG   Date Filed 09/02/22   Entry Number 344-2   Page 225 of 239
Kosuke Imai, PhD                                                   August 8, 2022
The South Carolina State Confvs.McMaster/Alexander

[racially - refer]                                                      Page 32

**racially** 184:8
**ragusa** 9:13
**raise** 162:5
**raised** 81:14,24
  82:6 97:9
**ran** 48:8,17,24
  50:8 52:9 53:7
  54:5 60:5 62:6
  62:11 64:10
**randomly** 23:23
  24:2,3
**range** 42:25 73:2
  90:12 94:17,18
  122:2 131:14,21
  132:21 137:4,7
  138:15,25 139:9
  139:15 140:17
  141:9,14,24
  142:9 171:16
**ranges** 21:8,12
  172:18
**rankin** 4:14
**rare** 22:22
**reach** 14:24 96:3
  172:21,21
**reactive** 81:23
**read** 36:9,18
  38:3 39:14
  43:10,19 44:2,11
  50:7 66:8 73:4
  88:10,16 100:2
  101:2,23 108:9
  138:18 147:10
  154:15 159:9
  181:19 184:20
  186:16 190:9
  192:5

**reading** 90:9
  116:10
**reads** 101:16
**real** 56:4 91:16
**realistic** 36:12
  36:21
**really** 36:3 52:19
  57:10 59:2,5
  66:21 67:13
  76:10 85:6,25
  89:14 91:22
  139:6 156:25
  167:11
**rear** 3:23
**reason** 4:24 6:3
  42:17 48:10
  55:6 57:5,17
  62:2 74:17
  75:15,16 76:22
  81:23 85:5
  96:14 105:24
  113:13,16
  117:21 129:21
  164:12 169:2
  190:11 191:6,9
  191:12,15,18,21
**reasons** 21:7
  40:18 81:18
  143:16
**rebuttal** 17:4
  173:13,15,17
  174:18,23 175:9
  175:11,13,17,25
  176:3,5,12
  189:23
**recall** 7:7 9:4
  10:10 12:5
  13:22 14:25

21:5,7,13,18
  40:1 41:5 48:25
  55:10 59:20
  60:3,8 63:7,8,13
  72:5,8,9,11 79:9
  87:17 96:17
  120:21 133:8
  134:11 139:22
  149:5 157:22
  168:21 169:2,4,7
  173:6,23 174:1,6
  178:23 179:22
  181:11
**receipt** 190:18
**receive** 11:14,19
  11:24 46:12,13
  46:18
**received** 8:6
  11:21 13:1
  18:25 19:9,11,12
  69:7 70:1
**receiving** 10:10
  174:6
**recess** 64:24
  77:10 126:23
  134:24 177:6
**recognize** 10:5
  16:15 18:19
  34:11 68:23
  69:20 155:24
  173:20 179:19
**recollection**
  179:23
**recombination**
  65:9,15 189:14
**record** 4:8 5:4
  13:5 19:2 53:15
  64:23 77:8

126:21 134:22
  150:13 158:23
  158:23 170:8
  175:14,21 177:4
  187:6
**recreate** 174:21
**rector** 2:15
**redirect** 182:19
**redistricting**
  4:16 8:2,17,18
  17:10 19:15,18
  19:22,24 20:5,8
  21:3 27:7,8,20
  27:21,23 28:1,5
  34:4,15 37:9,25
  38:18 43:18
  45:10 46:10
  54:24 56:6
  63:23 65:10,16
  67:3 68:8,12,18
  68:20 69:2,4,15
  69:16,23 72:14
  73:20 74:1
  83:15 96:16
  99:10 136:25
  181:1 182:13
  189:12,15,17,19
  189:20,21
**redrawing** 55:2
**reduce** 108:18
  141:20 168:11
**reduced** 86:15
**reductive** 85:4
**reelection** 118:3
  183:8
**refer** 29:19,21
  70:2

**[reference - requires]**                                    Page 33

| | | | |
|---|---|---|---|
| **reference** 8:7 | **relation** 50:9 | 22:5,15 23:12 | 185:8,13,17,21 |
| **referenced** 62:13 | **relative** 81:22 | 24:25 25:10 | 185:24 186:3,6 |
| 162:14 190:6 | 85:9 89:15 | 27:2,12,23 29:15 | 186:10,13 187:1 |
| **referred** 37:2 | 101:16 133:14 | 29:23 30:2,6,6 | 188:12 |
| **referring** 40:21 | 139:6 | 30:24 31:14,18 | **reports** 8:3,15 |
| **refers** 30:25 | **relevant** 11:12 | 32:5,21 40:17 | 8:15,24 9:2,5,6 |
| 176:24 | 37:25 40:7 | 45:25 47:1,15 | 13:9 27:17 46:7 |
| **reflect** 60:18 | 43:14 71:18 | 48:9,10,13,15,18 | 47:25 48:1 |
| **reflects** 132:11 | 77:22 97:13 | 50:7 51:14,21 | 55:11 169:5 |
| **regarding** 156:1 | **reliance** 66:11 | 52:22,23,23,24 | **represent** 4:12 |
| **regardless** 66:15 | **relied** 13:3 | 53:18 54:11 | **representative** |
| 183:13 | **rely** 12:22 | 56:10 58:1 | 8:2 23:17 32:24 |
| **regenerate** 23:17 | **remainder** | 59:19,22,24 | 33:4,13,18 44:10 |
| **region** 146:24 | 165:24 | 62:14 63:12,16 | 44:14 101:22 |
| **regions** 61:1 | **remember** 6:12 | 63:17 68:6 69:6 | 135:20 |
| **registered** 26:15 | 116:25 172:17 | 70:6 74:5 77:3 | **representatives** |
| **registration** | 174:10 | 77:15 78:18 | 68:17 69:3 |
| 110:9 | **remove** 172:20 | 80:7 88:6 92:15 | 73:24 189:16 |
| **regular** 184:24 | **removed** 139:19 | 94:1,24 97:12 | **represented** 5:7 |
| 185:23 | **renaming** 88:11 | 103:18 106:24 | **republican** |
| **rejected** 20:22 | **rendering** 39:10 | 111:19,22 | 32:12 110:4,19 |
| 21:6 22:10,24 | **repair** 176:25 | 112:18 122:15 | **republicans** |
| 23:7 154:22 | **repairing** 155:3 | 126:10 130:12 | 182:5 183:13 |
| 159:13 170:4 | **repeat** 8:25 | 138:3 140:25 | **request** 6:5 11:4 |
| **rejection** 22:19 | 20:17 22:12 | 141:6 156:17 | 18:25 55:13 |
| **rejections** 21:2,8 | 52:16 90:24 | 157:24 166:18 | **requested** |
| **relate** 22:4 | 144:3 155:15 | 169:3 173:13,17 | 188:16,18 |
| 162:14 | 164:25 | 174:3,18,23 | **require** 84:4 |
| **related** 16:20 | **rephrase** 99:1 | 175:4,9,11,11,16 | 110:23 |
| 22:7 23:18 | 134:4 | 175:17,25 176:3 | **required** 73:19 |
| 31:24 56:24 | **report** 6:22 7:22 | 176:5,13 178:1,3 | 110:18 155:12 |
| 57:24 59:9 60:1 | 8:14 11:2,17,21 | 178:6 179:25 | 192:13 |
| 60:4,23 61:22 | 11:24 12:22,25 | 180:21,21 189:7 | **requirement** |
| 62:5 63:18 98:2 | 13:3,11,14,16 | 189:23 | 67:9 72:9 |
| 98:2,5,7 100:14 | 14:14 15:2,7,15 | **reported** 1:16 | **requirements** |
| 102:17 132:15 | 15:19,24 16:5,9 | **reporter** 1:16 | 67:3,15,16 73:12 |
| 132:18 187:7 | 16:18,19,24 17:2 | 4:20 5:2 10:5 | **requires** 84:4 |
| | 17:4,8,12,14,21 | 184:19,23 185:3 | |

Kosuke Imai, PhD

August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[research - rmg]**

Page 34

| | | | |
|---|---|---|---|
| **research** 15:5,6 | **review** 8:12 | 82:10 83:21 | 135:17,21,22 |
| **residence** 12:12 | 15:23 20:21 | 84:11 86:22 | 138:2,9 140:12 |
| 105:6 | 21:13,22 23:3 | 87:2,10,11,11 | 140:12,15,16,16 |
| **residences** | 69:5,25 150:12 | 88:3,15,17,21,24 | 140:23 141:5 |
| 103:25 106:5 | 150:16 155:1 | 88:25 89:8 90:5 | 142:20,21 143:3 |
| **resides** 88:20 | 190:7 | 90:7,8,15 91:5,6 | 144:7,20 145:17 |
| 153:18 | **reviewed** 6:22 | 91:9,10 92:3 | 146:1,4,11,15,17 |
| **respect** 22:3 | 8:14,15,17,20,23 | 93:3 94:2,3,5,6 | 146:22,24 147:3 |
| 49:9 55:12 63:2 | 9:1,6 17:8 20:12 | 94:10,15,16,24 | 147:21,22 148:5 |
| 106:8 145:1 | 21:12 158:22 | 94:25 95:7 | 148:6 149:12,21 |
| 152:24 156:4 | **reviewing** 9:4 | 96:13 97:10,11 | 149:21,25 |
| 165:15 | **reviews** 16:1 | 97:11,18 104:10 | 150:23 151:8,11 |
| **respecting** 73:21 | **revise** 22:24 | 105:17 106:7 | 151:23 152:5,5 |
| **resplit** 23:25 | **richland** 133:22 | 107:8,13,18,23 | 152:11 153:3,12 |
| **rest** 28:15 42:9 | 158:2,6,14,16,20 | 108:24,25 | 153:16,18 154:1 |
| 61:8 96:5 | 159:6,12,18 | 109:12 110:1,5,8 | 155:23 156:5 |
| 152:21 154:6 | 160:5,18,20 | 110:17,21 111:5 | 158:12 159:15 |
| **restraint** 61:1 | 161:2,5,8,9,17 | 111:22 112:14 | 159:24 160:3,9 |
| **resubmit** 22:25 | 162:7,11,23 | 112:20 114:6,10 | 160:21,21 |
| **result** 48:2,23 | 164:2,24 165:5 | 114:11,15,16,19 | 161:19,24 162:8 |
| 49:1,7 84:15 | 165:15,20 166:4 | 114:24 115:20 | 162:8,9,12,15,16 |
| 89:17 119:22 | 166:20 167:8,17 | 116:11,14,15,18 | 163:3,8,13,14,16 |
| 159:21 | 168:19 183:20 | 116:19,21,24 | 163:16 166:5,5 |
| **resulted** 58:20 | **right** 17:3 18:9 | 117:4,7,10,13,18 | 166:12,13 |
| **results** 48:19,25 | 25:5,5 26:7,21 | 119:7,8,20,23 | 167:10 170:5 |
| 51:22,25 57:12 | 28:17,23 29:11 | 120:4,16,20,22 | 171:10,17,25 |
| 59:19,21,23 63:8 | 30:3,4 33:1,5 | 121:8,9,11,12,16 | 172:7 173:7 |
| 63:13 76:18 | 34:1,18 35:1,5 | 121:25 123:13 | 178:2,7,8,8,11 |
| 89:20 132:20 | 44:20 47:20 | 124:1,2 125:5,16 | 178:12,16,25 |
| 136:11 142:13 | 48:20 50:16 | 125:22,23 126:8 | 179:5,9,14,15 |
| 142:22 157:3 | 51:1,8,8 53:2,6 | 126:17,19,25 | 180:5,20 181:13 |
| 170:14 178:13 | 56:18 58:24 | 127:7,8,16,18,22 | 181:17,18,20 |
| **retained** 14:8 | 60:1 64:4,17 | 127:23,25 128:2 | 183:4 184:5,10 |
| **retention** 176:6 | 65:17 68:2,8,13 | 128:4,16,17,17 | 184:24 186:16 |
| 176:8,12 | 70:19 71:15,20 | 129:6,15,18,23 | 186:17 |
| **retreat** 23:25 | 71:24 72:3,16,20 | 130:4,5,11,18,19 | **rights** 137:13 |
| **return** 11:8 | 73:9 74:9 75:21 | 131:9,17 133:12 | **rmg** 1:6 |
| 190:13,17 | 76:4 80:13 | 133:15,16 135:4 | |

Kosuke Imai, PhD                                                            August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[roads - sense]**                                                            Page 35

**roads** 101:20
  102:3
**robust** 136:11
  157:3
**robustness**
  157:14
**role** 30:13 55:2
  56:6,16,25 57:10
  58:10 59:4
  76:10 105:25
  112:25 113:5
  142:2,15 156:22
  180:22,25
**roman** 72:18
  73:12 99:17
  101:11
**room** 6:18
**rough** 185:5,7,10
  185:14,15
  186:11
**rounds** 129:24
**ruiz** 1:16 187:3
  187:24
**rule** 5:20 48:7
  59:14 62:9
**rules** 48:13
  181:2
**run** 15:16 23:24
  47:22,24 48:18
  50:3,13 53:17,18
  53:23 81:24
  82:12 86:23
  95:24 113:14
  149:19,23 157:4
**running** 146:3
**runs** 149:9,18

**s**

**s** 2:14 3:5 15:10
  15:12 189:1
  191:3
**sake** 42:7
**samantha** 3:21
**sample** 23:17
  32:24 33:4,13,18
  36:13 39:3 44:4
  44:9,10 78:16
  79:25 82:8,16
  95:9
**samples** 33:22
  44:14
**sampling** 34:4
  36:10 39:7
  43:17,22 75:22
  80:4 81:20
  189:11
**satisfied** 81:11
  143:9
**satisfies** 140:10
**satisfy** 32:25
  79:22 80:2
  140:13 142:18
  143:14
**satisfying**
  142:25
**saturday** 7:6
**saying** 47:12
  93:24
**says** 18:17 32:23
  36:10,23 44:3
  48:16 66:16
  72:21 73:12,14
  88:11 92:15
  97:12 99:22
  100:24 109:18

109:20 121:1
  138:14 140:25
  141:6 142:14
  146:5 150:19
  162:6,10
**sc** 3:5,11,16
**scale** 36:11 39:7
  85:5 89:15,15
**scholarship**
  19:19,22 20:5
**science** 19:13
  20:2
**scope** 67:25
**score** 133:3
**scores** 130:17
**scott** 190:4 191:1
  192:1
**scratch** 24:12
**screen** 18:2,11
**scroll** 24:20
  38:19 99:13
  102:25 174:3
**se** 40:4
**seal** 187:11
**sean** 8:3,15
  173:14 189:23
**second** 20:9 26:6
  40:24 43:11
  44:7 61:9 64:14
  64:17 65:1 89:6
  95:24 96:2
  99:15,20 103:10
  107:25 108:1
  157:1,4 177:25
**section** 73:15
  126:10
**see** 10:17,19
  14:15 18:2,14,15

20:23 30:21
  31:23 45:3 47:3
  67:7 82:13
  89:21 93:4 94:8
  99:18 102:24
  108:3 111:8
  113:5,16 115:14
  115:17,17,25
  120:24 126:9
  127:14 132:6
  138:22 141:16
  156:21 158:8,11
  160:25 161:22
  163:25 164:7
  181:25 182:1
**seed** 37:13,16
**seeing** 107:4
  146:19 178:24
**seen** 53:10
**select** 137:2
**selected** 36:14
  82:10 83:10
**senate** 1:15 2:18
  4:12,13,14 8:3
  8:18 9:20 68:7
  69:15,24 72:3,6
  73:8 74:11,12
  91:7 101:6,7
  102:21 103:1
  136:25 180:5,13
  189:4,21
**send** 184:21
**sense** 5:5,6,19
  6:7,8 29:20 42:5
  67:17 76:24
  83:12 100:22
  103:13 142:12
  162:1

**[sent - simulated]**                                              Page 36

| | | | |
|---|---|---|---|
| **sent** 6:23 7:22,24 8:1,4,16,18,20 9:17 11:10 12:19 43:7 90:2 174:9 190:14 | **sets** 52:25 89:18 | **shows** 94:7 114:14 116:12 120:13 130:16 146:9 151:14 152:11 160:15 166:21,21 169:23 | **simulated** 31:24 40:22 50:17,19 50:20 51:11 75:9 76:14 79:17 81:10 82:3,5,14,21 83:3 84:16 |
| **sentence** 30:17 36:7,23 37:3,19 37:22 43:11 66:1,2,14,16,22 66:24 88:10 108:1 109:7 154:10 | **setup** 88:18 **seven** 29:13 30:17 69:13 73:7 90:21 91:4 91:18 92:5,10 101:5 109:13 110:19 | **side** 46:15 90:5 94:15 116:11 153:22 | 86:13,15,16,17 87:22,24 88:1,13 88:18 89:22,25 92:13,21,23,25 93:8,9,11,12,19 94:17 96:24 |
| **sentences** 37:22 40:1 44:3 | **seventh** 10:13,14 **shakes** 5:5 | **sign** 184:20 186:16 190:12 **signature** 187:22 188:11 | 97:21 98:12 100:10 117:15 119:6,12,15,18 120:1,8,14 |
| **separate** 124:1 **separated** 126:1 **sequence** 35:21 42:1,22 | **shape** 55:15 100:20,22 102:9 132:12 158:19 **share** 10:2 16:14 18:1,2,3,10 25:16 34:10 | **signed** 190:20 **significant** 30:13 140:2,5,7 141:1 141:3,7 142:2,9 142:11,15,17 144:1,5,11,16 180:22 | 121:15,20 124:17,18,25 125:1,4,7,10,12 125:15,17 126:11,11 131:15 132:21 |
| **sequential** 24:11 34:3,25 35:4,10 35:14,23,24 38:10 189:11 | 47:4 65:13 69:19 110:24 179:7 **shared** 12:2,6,10 18:20 178:23 | **significantly** 131:12 **similar** 41:4,12 61:14 122:16,24 | 132:23 136:2 139:8 141:11 144:13,14,17,20 144:21,23 147:7 |
| **sequentially** 35:23 38:2 | **sharepoint** 46:15 **she'll** 5:3 | 127:4 134:12 139:16 152:13 160:3 163:25 | 147:8,12 148:20 150:1,10,23 151:8,17,20,22 |
| **set** 32:23,25 33:9 33:17 37:9 44:7 44:19 50:17 51:3 52:10,11,19 52:20 53:5,8,17 53:18 56:12 57:6,11 58:14 59:8,10,25 67:10 81:1 87:10 93:24 94:1,4 109:20 139:13 140:10,14,18 142:19 143:2,10 144:21 | **sheet** 190:11 **shifted** 90:17 **shiro** 15:7,10,14 **show** 49:8 116:16 127:17 146:14,14 157:15 161:20 164:10 **showing** 73:18 121:13 128:6 133:4,5 151:13 165:14 170:16 **shown** 118:12 158:13 | **similarity** 54:12 **similarly** 106:4 125:7 126:15 139:20 176:24 **simple** 30:25 75:17 **simply** 11:3 31:20 37:8 163:11 166:9 | 152:7,12,21 153:19 154:12 156:23 159:6,7 161:1,5 162:1,7 162:10,20,22 165:8,24 167:12 167:13 168:2 169:24 170:25 |

**[simulated - speaking]**                                            Page 37

| | | | |
|---|---|---|---|
| 172:11,19,24 | 131:8 132:5 | **sir** 25:22 | 139:11,12 |
| **simulation** 17:9 | 133:3 134:13 | **sit** 116:21 175:2 | **software** 18:4 |
| 17:10 21:16 | 135:5,7,18,25 | **six** 29:13 37:14 | 45:14 63:5,6 |
| 22:4,9,14 32:1 | 136:10 138:13 | 37:14 40:23 | **solange** 1:16 |
| 33:17 34:15 | 139:14,19 140:3 | 61:11 68:15 | 187:3,24 |
| 36:20 40:21,25 | 140:15,18 141:3 | 69:10 72:13 | **solutions** 190:23 |
| 42:8 43:14 | 141:6,22 142:6 | 73:6 79:6,14 | **sorry** 8:25 25:25 |
| 47:23 48:2,23 | 143:2 144:2,6,10 | 90:11 91:17,20 | 47:6 63:7 85:15 |
| 49:2,3,23 50:3,8 | 145:20 147:20 | 92:2 99:14,17 | 108:1,12 109:15 |
| 50:13,23 51:3,15 | 148:10,11 149:2 | 101:4 107:7 | 113:11 134:1 |
| 51:22,24 52:10 | 149:22 150:5 | 110:19 122:18 | 138:6 155:15 |
| 52:11,20,25 53:4 | 151:4,24 152:25 | 122:20 123:6 | 162:20 164:25 |
| 53:8,18,23 54:11 | 153:2,8,14 154:1 | 130:13 131:4 | **sort** 125:13 |
| 56:12 59:8,25 | 156:3,8 160:19 | 134:1 142:3 | 132:15 139:2 |
| 60:24,25 61:10 | 161:14,16 | 162:11,24,25,25 | 157:14 |
| 62:6 63:9,16 | 163:21 164:18 | 163:7 183:13 | **sorts** 61:19 |
| 64:11,14,19 | 164:22,23 165:4 | **size** 75:3 102:10 | **sound** 129:15 |
| 66:17,18 67:1,21 | 165:19 167:7,21 | 102:11 | 142:8 172:6 |
| 71:9 74:17 | 167:22 168:4 | **skip** 37:21 | **sounded** 178:14 |
| 76:17,25 77:4,18 | 171:20 173:5 | **slash** 72:19 | **sounds** 129:18 |
| 81:14 82:7,12,17 | 178:13 180:3 | **slate** 24:13 35:4 | 140:9 174:7 |
| 84:23 85:18,23 | 181:6,13,23 | 35:15 36:4 41:7 | **south** 1:1,3 2:2 |
| 86:1,1,7,8,11,23 | **simulations** | 41:10 42:3,21 | 4:16 6:14 8:1 |
| 86:24 87:10,18 | 15:17 40:20 | **slightly** 89:25 | 14:16 20:13 |
| 89:18 90:7 | 41:2 42:13 | 90:17 | 28:12,13 29:16 |
| 91:14,15 92:2 | 44:18 54:5 | **slow** 44:9 | 31:4 46:9 68:7 |
| 94:9,14 95:22,24 | 63:21 67:6 78:7 | **small** 18:13 | 68:16 69:3,15 |
| 95:25 96:2 97:9 | 103:8 107:23 | 73:17 80:1 | 96:16 108:15 |
| 103:11 104:8 | 109:23 112:15 | 86:13,18 87:12 | 112:5 180:4 |
| 107:8,11,21 | 112:19,19 | 139:18 161:22 | 187:4,12 189:16 |
| 111:9,12,13 | 130:18 135:8 | **smaller** 89:24 | 189:20 190:4 |
| 113:3,8,14,17,19 | 148:15 178:5,10 | **smc** 36:3 37:18 | 191:1 192:1 |
| 113:20,25 114:4 | 179:4 | 37:24 38:5 | **southeast** 190:15 |
| 114:9 118:22 | **single** 38:17 | 40:17 41:3,7,17 | **space** 37:25 39:7 |
| 121:5 122:3,7,17 | 90:11 178:1 | 42:9,12,20 | 39:12 |
| 122:25 124:3,14 | 183:17,20 | **soft** 79:19,20,24 | **speak** 91:22 |
| 127:1,5 128:18 | **sinko** 15:11,11 | 80:5,14 81:5 | **speaking** 23:21 |
| 129:4 130:2,5,24 | | 86:23 93:17 | 104:22 125:16 |

Kosuke Imai, PhD                                                        August 8, 2022

The South Carolina State Confvs.McMaster/Alexander

**[speaking - step]**                                                      Page 38

166:8
**specific**   23:25
   24:10 31:8 39:3
   39:20,22 40:3,7
   43:25 48:25
   63:13 73:19
   80:25 92:13
   96:18 98:21,24
   99:4 125:2,12,15
   137:1,2 138:23
   138:24,25 139:2
   149:9 156:1
   167:13 168:1
   182:1,8 183:18
**specifically**   59:4
   183:25
**specifics**   14:25
   21:7,14 59:20
**specified**   32:25
   33:9,14 96:17
   97:20 111:2
   171:12
**specify**   41:21
   43:1 97:1 168:1
   182:8
**specifying**   33:9
   85:7
**spell**   4:8 15:8
**spelled**   4:10
**spike**   154:11
   167:3
**spin**   115:5
**split**   23:11,21
   24:3,18 33:6
   41:5 42:6,8,10
   77:24 78:1 79:9
   79:12,14 89:5,7
   89:7,22 91:20

92:6 93:17
94:20,21 95:18
95:20,23 96:1,4
96:7,11 97:2
108:5,17,23
123:24,25 124:4
124:18 125:2,5
126:12 133:20
133:24 134:2,7
148:14 151:4
154:18,22 155:3
157:6,19,23
158:7,10 159:6
159:12 160:10
161:5,17,25
162:7,23 163:6
164:15 165:11
166:14,17 168:2
168:15,18
169:11,15,18
170:9,20
**splits**   79:5,10
   89:19,20,23 90:1
   90:14,20 91:12
   91:17 92:2,10,14
   92:16,25 93:2,7
   93:9,12,13,15,18
   94:1,5 95:6,10
   95:12,17 96:21
   96:23 106:15,15
   107:2,8,13 108:7
   108:13,18,23
   125:8,17 139:4
   150:20 160:20
   168:12,12 177:1
**splitting**   31:1,2,3
   31:3,15,20,21,23
   41:11 79:8

108:20 109:3,5
155:3 166:10
167:23 168:5
**spoken**   184:15
**spread**   41:6
   96:18
**staff**   45:6 179:9
**stand**   43:21,23
**standard**   33:22
   147:6
**star**   44:24
**start**   24:1,4,7
   25:19 35:15,21
   36:1,4,6 37:12
   37:15 41:24
   42:2 43:2 70:9
   114:2 145:18
   156:25 159:5
**started**   58:12
   122:20 156:17
   178:4
**starting**   30:17
   36:4 41:10
   145:22 176:16
**starts**   24:12,13
   29:12 35:4,6,15
   35:25 37:22
   38:25 41:7
   42:20 43:12
   66:3 70:15
   127:3
**state**   1:3 2:2
   14:15,16 27:14
   28:5,14 39:12
   73:24 75:8,24
   102:8 107:20
   155:13 187:4
   190:4 191:1

192:1
**statement**   38:7
   38:17 43:21
   66:12 126:16
**statements**
   150:16
**states**   1:1 41:24
**statewide**   41:15
   42:5,13 64:19
   85:18,25 90:6
   92:1 95:22
   102:12 104:14
   107:22 113:8,14
   113:16,20
   133:23 135:4,7
   135:25 138:13
   139:14 140:2,15
   141:3,6,15,22
   144:1,6 145:20
   148:11 156:3,7
   157:2 160:19
   163:21 164:18
   164:22,23 165:4
   167:22 173:4
**statistic**   126:16
**statistical**   20:1
   26:12 30:11,12
   31:23 40:4
   99:25 124:20
   125:13 131:11
**statistically**
   131:19
**statistics**   19:11
   21:22 167:10,16
   174:22 176:2,7
   176:20
**step**   50:19 113:2
   167:17

**[steps - tends]**                                              Page 39

steps 52:19
straddles 137:8
street 2:5,10,15
  3:5,11,16
strength 80:9,11
  80:16,20,22
  81:23,25 82:9,10
  82:16,23 83:4,19
  83:25,25 84:24
  85:10,21 89:11
  89:11 95:2
  105:15,21 106:5
  138:10,16 139:5
strengths 80:8
  80:13 83:9
strict 73:1
strong 80:17
  84:7
stronger 85:11
  85:22
struggle 36:15
  36:24 39:6
struggling 11:4
student 45:7
studies 19:19
study 20:1
studying 21:25
subcommittee
  69:16 189:22
subdivision
  73:21
subject 78:10
submit 11:3
  22:23
submitted 11:13
  17:20 20:15,20
  23:2 27:5,12,17
  27:22 145:2

subpoena 10:20
subscribed
  192:14
subset 160:14
  163:14,15
substance 48:5
  48:15
substantive
  76:16
successful 36:10
suggest 181:22
  182:3
suggested 30:15
suggestion 56:2
suitable 38:15
suite 2:5,10 3:5
  3:11,16
summarize 38:9
  161:12
summary 29:12
sumter 133:23
  169:8,14,15,18
  169:24 170:3,12
  170:15,20 171:3
supplement 17:1
suppose 129:17
supreme 28:4
sure 11:9 20:18
  22:13 23:8
  27:16 32:11
  34:23 45:22
  47:8 61:3 79:12
  81:10,21 82:4
  83:23 84:20
  86:21 90:25
  93:14 95:14
  100:10 107:19
  112:17 114:1

115:4,5 117:3,4
  126:2 129:25
  136:7 141:23
  143:17,20 144:4
  153:6 155:16
  157:2,5,11 158:5
  165:1 167:20
  168:20 175:23
  175:23 185:16
surname 26:19
suspect 119:13
swapping 24:8
swath 146:22
sworn 4:2
  192:14
systematically
  44:6,18

**t**

t 189:1 191:3,3
tab 9:17 16:7
  25:8,9,10,15,21
  34:7,9 47:16
  65:3,4 68:10,13
  69:10 72:13,15
  73:6 99:8,9
  101:4 173:10
table 130:24,25
  163:23 169:23
tabs 47:12
taiwan 190:4
  191:1 192:1
take 5:2 6:2,4,4
  6:6 7:4 19:14,17
  46:24 50:23
  66:24 67:8 69:9
  75:9,18 77:6
  95:17 100:12

102:13,15 115:7
  124:10 129:20
  131:19 136:21
  166:2 185:7
  186:2,9
taken 1:15 42:14
  64:24 77:10
  102:18 126:23
  134:24 177:6
talk 13:20 50:25
  53:3 70:14 89:2
  89:5 113:23
  126:25
talked 32:18
  35:3 77:18 97:6
  118:24 148:22
talking 92:20
  95:12 109:20
  123:8 128:12
  164:5 165:23
  175:10,13
target 33:8
  36:14 39:3
  82:19
taught 45:7
technical 42:17
  70:24
tell 4:22 14:12
  41:21 42:3
  66:17 76:2
  107:15 150:8,9
tells 80:17 85:5
ten 45:17 60:16
tend 150:1,2
  165:12,13
tends 139:23
  151:9 165:8

**[trende - use]**                                                Page 41

176:16,24
189:23
**trende's** 174:14
175:3,25 176:11
176:20
**trends** 19:24
20:8
**trial** 16:24
**tried** 18:10
26:15 42:16,20
47:6 100:9
129:14 153:11
157:14
**trivial** 87:12
**trouble** 90:9
**true** 44:7,19
82:22 88:1
114:25 141:2
155:24,25 187:5
192:8
**trump** 110:24
**trust** 129:18
172:8
**truth** 4:22
**truthfully** 4:25
**try** 23:16 42:15
68:3 77:3,7
109:4 168:11
**trying** 20:10
25:15 76:5,6
109:2 149:13
**turn** 9:18 10:12
17:13 32:20
70:5 73:6 74:5
78:18 101:4
120:10 126:19
157:24 184:16

**turnaround**
184:24 185:2
**turning** 94:19
**twenty** 88:7
130:13 138:9
**two** 7:11,12,16
8:3,15 14:1 16:7
16:13 20:6
23:23 24:2,6
25:4,5,8,10,16
25:21 27:18
41:1,2,6,10
42:10 45:13,13
47:16,19 52:19
61:7 63:1,5 64:3
73:13,15 75:16
79:8,10,11 83:4
86:1 88:13
97:19,22 104:13
114:22 115:6,7
119:23 121:17
122:9,18 126:1
130:8 133:13
136:5,15 145:7
157:1 162:11,23
162:24 163:7
166:15,17
167:13 173:24
174:8 180:7,9
**tyler** 15:11,18
**type** 23:11 24:18
33:6,6,24 37:17
42:6,15 78:14
79:21 80:16
98:1 102:17
**types** 12:8 24:6
24:15

**typically** 74:21

**u**

**u** 15:11
**u.s.** 73:16
**uh** 20:19 30:19
37:1 70:16
72:17 74:6
81:17 85:1,19
94:25 99:16,21
101:13 104:24
106:13 107:3
108:8 111:18
114:13 115:10
116:15 118:14
124:11 125:20
127:19 131:5
132:2 135:13
138:12 142:7
146:4 147:9
148:12,24
149:17 150:24
154:9 155:18
156:6 158:3
159:25 163:24
164:3 165:2
169:22 170:18
172:14 176:9,18
181:21
**ultimately**
153:15
**un** 179:25
**unable** 4:24
**unchanged**
114:9
**unclear** 53:16
**understand** 4:17
4:21 5:18,21

17:18 22:13
32:20 50:6,24
52:18 59:6
67:25 70:25
78:25 85:3
89:12 93:21,24
95:1 114:4
115:4 127:4
128:4 130:16
143:21 144:8
**understanding**
20:2 45:20
52:17 71:25
83:22 128:5
**understood** 5:25
23:9 86:6
162:13
**unfortunately**
17:23 36:14
**union** 2:4,9
**united** 1:1
**units** 24:8,8
74:21
**universe** 83:20
95:3,4
**university** 19:10
**unknown** 57:6
57:11 58:8
**untouched** 61:8
**unusual** 31:22
31:24 150:22
164:14,14
**updated** 17:23
**uploaded** 34:10
**uribe** 1:16 187:3
187:24
**use** 12:4,17 17:9
26:13 30:24

**[use - washington]**                                                    Page 42

| | | | |
|---|---|---|---|
| 31:7,22 33:6,22 | **variety** 176:7 | 123:17,18,21,24 | 116:13,16 |
| 39:4,20,22 40:16 | **various** 53:3 | 123:25 124:3,7 | 118:16 146:10 |
| 41:23 42:6,7,9 | 84:5 130:17 | 124:12,22 125:5 | 147:1 |
| 54:23 55:7 | 149:1 | 125:25 127:21 | **vtds** 108:5,20,23 |
| 61:17 71:14 | **varying** 88:25 | 128:8,23 129:3,5 | 109:4,4,7 114:14 |
| 74:7,15 75:1,25 | **vast** 107:12,22 | 129:8 145:13 | |
| 83:23 87:23 | 131:7 154:12 | 148:4,13,14 | **w** |
| 102:22 103:18 | **verbal** 5:3 | 149:10,16,23 | **w** 15:11,13 |
| 105:7 109:7,22 | **verify** 190:9 | 150:1,6,7,9,11 | **wait** 133:8 138:4 |
| 110:2 111:4,8,22 | **veritext** 190:14 | 150:22 151:6,7 | 175:10 |
| 118:18 122:14 | 190:23 | 151:25 152:1,8 | **waive** 186:17 |
| 125:23 128:25 | **veritext.com** | 152:11,14,16,17 | **walk** 34:20 78:4 |
| 144:17 147:3 | 190:15 | 152:21 153:1,25 | 84:17 |
| 149:13 155:9 | **version** 25:11,13 | 154:5 164:23 | **wang** 15:12,13 |
| 159:19 170:13 | **versus** 28:21 | 165:4,15,19 | **want** 9:18 13:20 |
| 181:9,10,12,16 | **vertical** 151:18 | 166:10 167:2,7 | 25:18 26:24 |
| 182:1,9 | **viability** 67:17 | 167:23 168:10 | 32:20 36:6 38:7 |
| **uses** 30:20 | **viable** 66:5,19 | 168:13 176:25 | 38:16 40:6 |
| 102:10 | **video** 9:21 189:5 | **voting** 106:12 | 43:10 44:2 47:8 |
| **usually** 31:7 | **videoteleconfe...** | 114:17,18,21,23 | 56:18,22 57:10 |
| **v** | 1:16 2:5,10,15 | 115:8 137:13 | 57:16 61:17 |
| **v** 190:4 191:1 | 2:20 3:4,10,15 | 151:15 160:5,7 | 62:3 63:15 |
| 192:1 | **view** 38:5 56:5 | 160:17,18 | 70:24 81:3 |
| **valid** 39:16,18 | 71:10 112:4 | 170:20 184:9 | 106:2 108:17 |
| 44:7,19 | 131:22 183:6,11 | **vra** 41:20 42:22 | 109:6 111:14 |
| **validity** 40:13 | 184:3 | 85:18 90:6 92:1 | 113:1 130:23 |
| 175:7 | **violated** 57:18 | 107:20,22 | 140:6 167:11,18 |
| **value** 81:17,19 | **vitae** 19:4 189:9 | 109:20 112:20 | 185:14,17 186:1 |
| 81:22,25 82:7 | **vote** 110:24 | 112:22 113:9,14 | 186:10 |
| 85:2,4,10,11 | **voter** 26:11,13 | 113:19,21 135:5 | **wanted** 41:19 |
| **values** 82:13,18 | 26:14 110:9 | 135:12 138:13 | 75:16 81:21 |
| **variables** 12:3 | 128:19 | 139:14 142:25 | 82:4 106:21 |
| **variation** 74:24 | **voters** 26:15 | 142:25 173:5 | 117:22 126:2 |
| 122:1 163:12 | 31:11,15,20,21 | 184:1,5 | 136:7 143:20 |
| **variations** | 49:10 64:6 | **vs** 1:6 | 156:24 157:5,10 |
| 161:23 | 104:19 118:21 | **vtc** 1:11 | 175:14 183:12 |
| | 119:11 122:3,6,8 | **vtd** 106:15 107:2 | **washington** 2:6 |
| | 122:12 123:15 | 107:8,12 108:17 | 2:11,21 |

**[water - zip]**                                                        Page 43

**water**  71:3,3
**way**  23:25 24:4
  24:10,23 27:17
  38:9 45:16 50:2
  60:12,13 66:15
  66:23 76:20,20
  83:16 89:16
  94:8 111:3
  131:10 133:10
  137:23 143:9
  144:18 150:19
  151:5 157:6,18
  164:16 182:25
**ways**  60:7,10,21
  63:1,4
**we've**  118:24
**weak**  81:6
**weaker**  85:12
**weakness**  40:8
**week**  7:6,8 48:17
**weeks**  7:8 27:3
  173:24 174:9
**weight**  79:20
**weighted**  84:8
**weights**  106:7
**went**  45:21 57:7
  62:1 87:9
  139:17,20 181:7
**who've**  60:18
**wide**  98:22
  107:20
**witness**  9:24
  13:7 26:8 27:1
  28:7 29:6 57:21
  60:7 63:11
  126:22 141:5
  148:19 149:7
  165:7,23 171:24

173:15 177:9,12
186:15 187:10
188:3 190:8,10
190:12,19
**witnesses**  43:16
**women**  64:6
  145:12
**wonderful**  107:1
**word**  30:20,20
  129:20
**words**  65:20
  66:20
**work**  14:18 54:6
  185:12
**working**  83:20
  121:17 178:4
**works**  20:15,21
  29:21 45:18
**world**  91:16
**written**  13:15
  20:12,21 34:14
  40:2
**wrong**  13:25
**wrote**  16:18

**x**

**x**  188:1 189:1

**y**

**yan**  2:9 7:15,18
  13:24 178:20
**yeah**  9:5,19
  12:25 14:16
  18:6,12 24:22,24
  25:12 26:2 57:5
  64:2,13,13,17
  68:5 82:25 83:6
  84:2 85:14 87:1
  87:5,13 89:14

90:13,16,19,25
92:9 94:13
97:15 104:2,15
105:13 106:16
106:18,21,21
107:19 108:3,14
110:2,6,11,21
113:12 114:25
116:4,6 117:2,9
120:5,6,17,21,24
120:24 121:1,6
121:22 122:2
124:20 126:4,14
126:18 129:7,17
129:18 130:6,22
131:1 132:10
133:13,14,16,16
133:22 134:2,5,5
134:5,6,10
137:10 140:6,23
143:19,19
145:11 146:7
147:15 148:3,22
149:12 151:3
152:20 153:19
154:16 155:25
158:16 161:8,11
161:13 162:13
162:19 163:1,1,2
163:5,5 164:10
168:20,20
171:18 172:5
173:11,25 174:8
176:22 177:3
178:14,19
179:15,21 180:6
181:25 185:6

**year**  29:17
**years**  12:10
  45:16,17 60:16
**yield**  44:10,14
**york**  2:16 187:12

**z**

**zero**  85:16 167:1
**zip**  9:17 17:24
  65:5 173:10

South Carolina Rules of Civil Procedure

Part V. Depositions and Discovery

Court Rule 30


(e) Submission to Witness; Changes; Signing.

When the testimony is fully transcribed the

deposition shall be submitted to the witness for

examination and shall be read to or by him unless

such examination and reading are waived by the

witness and by the parties. Any changes in form or

substance which the witness desires to make shall

be entered upon the deposition by the officer with

a statement of the reasons given by the witness for

making them. The deposition shall then be signed by

the witness, unless the parties by stipulation

waive the signing or the witness is ill or cannot

be found or refuses to sign. If the deposition is

not signed by the witness within 30 days of its

submission to him, the officer shall sign it and

state on the record the fact of the waiver or of

the illness or absence of the witness or the fact

of the refusal to sign together with the reason, if

any, given therefor; and the deposition may then be

used as fully as though signed unless on a motion

to suppress under Rule 32(d)(4) the court holds

that the reasons given for the refusal to sign

require rejection of the deposition in whole or in

part.


DISCLAIMER:  THE FOREGOING CIVIL PROCEDURE RULES

ARE PROVIDED FOR INFORMATIONAL PURPOSES ONLY.

THE ABOVE RULES ARE CURRENT AS OF APRIL 1,

2019.  PLEASE REFER TO THE APPLICABLE STATE RULES

OF CIVIL PROCEDURE FOR UP-TO-DATE INFORMATION.

VERITEXT LEGAL SOLUTIONS
COMPANY CERTIFICATE AND DISCLOSURE STATEMENT